

# THE ENVIRONMENT STRATEGY FOR SCOTLAND

REDUCING SCOTLAND'S INTERNATIONAL ENVIRONMENTAL IMPACT:  
LEARNING FROM INTERNATIONAL BEST PRACTICES

Report by the James Hutton Institute



## Disclaimers

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## 1. Acronyms

CBAM	Carbon Border Adjustment Mechanism
CE	Circular Economy
<a href="#">COP</a>	Convention of the Parties. The 'Parties' are the governments which have signed the UN Framework Convention of Climate Change (UNFCCC)
COVID	Coronavirus 19
CSDDD	Corporate Sustainability Due Diligence Directive
Defra	Department for Food, Environment and Rural Affairs (UK Government)
DG Agri	<a href="#">Directorate General Agriculture and Rural Development</a>
GDP	Gross Domestic Product
EC	European Commission
EEA	<a href="#">European Environment Agency</a>
ETS	Emissions Trading System
EU	European Union
Food-EPI	Food Environment Policy Index
FSC	Forest Stewardship Council
GFN	Global Footprint Network
GHG	Greenhouse Gas
GRI	Global Resource Initiative
GVA	Gross Value Added
IPCC	<a href="#">Intergovernmental Panel on Climate Change</a>
JNCC	Joint Nature Conservation Committee
JRC	Joint Research Centre (of the European Union)
NCD	Non-communicable Diseases
NDC	Nationally Determined Contributions
NECP	National Energy Carbon Plan
NFRD	Non-Financial Reporting Directive
NGO	Non-governmental Organisation
OECD	Organisation for Economic Co-operation and Development
OVAM	Public Waste Agency of Flanders
SAFA	Sustainability Assessment of Food and Agriculture Systems
SCP	Consumption and Production
SDG	Sustainable Development Goals
SDSN	Sustainable Development Solutions Network
SEA	Swedish Energy Agency
SEI	Stockholm Environment Institute
SEPA	Swedish Environmental Protection Agency
UK	United Kingdom

UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	<a href="#">United Nations Framework Convention on Climate Change</a>
WEEE	Waste Electrical and Electronic Equipment Directive (EU)
WHO	<a href="#">World Health Organisation</a>
WTO	World Trade Organization
WWF	World Wide Fund for Nature

## 2. Glossary

Term	Definition
Decoupling (relative and absolute)	<p><b>Relative decoupling</b> refers to a decline in the ecological intensity per unit of economic output, e.g. resource impacts decline relative to GDP whilst it grows.</p> <p><b>Absolute decoupling</b> refers to when resource impacts decline in absolute terms. If absolute decoupling is to occur, then resource efficiencies must increase at least as fast as economic output and must continue to improve as the economy grows.</p>
Offshoring	Offshoring refers to businesses based in one country but having their physical activities in another. This may have negative impacts, for example, work performed in the country of the activities may fail to meet the quality standards expected of a parent company based in the UK.
Transboundary spillover	Transboundary spillovers refer to the consequences, both positive and negative, driven by international trade and consumption.
Behavioural spillover	<p>Behavioural spillovers refer to changes in specific behaviours and in related behaviours. Henn <i>et al.</i> (2020) identified at least two types of spillovers:</p> <p>i) specific behaviours that can influence other behaviours; for example, consumers starting to buy “green products” could also start displaying other “pro-environmental” behaviours such as cycling or recycling (Lanzini &amp; Thøgersen, 2014).</p>

### 3. Executive Summary

This report details a brief review of policies to reduce the international environmental impact of Scotland's consumption and production. The objective has been to develop insights from the international academic and grey literature, together with international examples of the use of policy levers, to help inform the Scottish Government's Environment Strategy.

The Environment Strategy creates an overarching framework for Scotland's policies on the environment and climate change. Its 2045 vision sets out the Scottish Government's ambitions for restoring Scotland's natural environment and playing Scotland's full part in tackling the climate and nature emergencies. It recognises that this will rely on systemic economic and societal changes but that these, in turn, can help to transform Scotland for the better – for example, by improving people's health and wellbeing, tackling inequalities, and supporting new opportunities for green jobs and businesses.

The strategy recognises that Scotland's current demand on nature far exceeds its capacity to supply. Some of the commodities consumed are associated with damaging environmental impacts in the countries where they are produced, including deforestation, water stress and species overexploitation. In addition, the ways in which resources are used and disposed of also create environmental impacts far beyond Scotland's borders. Reflecting this, one of the Environment Strategy's six outcomes is that *"We are responsible global citizens with a sustainable international footprint"*. This report aims to support the evidence base to inform the development of a 'pathway' for achieving this outcome.

The report consists of two parts, the first takes a global perspective, the second reviews specific policy levers and examples of best practice for reducing Scotland's international footprint.

#### Key messages:

- Reducing consumption of resources can be considered as a '**wicked problem**' being complex and multi-faceted, with competing interests and perspectives. It poses substantial dilemmas and contradictions within a global economic system that depends on consumption for growth and economic stability.
- To bring the global environmental footprint within planetary boundaries, fundamental changes are required to overall consumption levels, for which the **public, private, third sectors, and individuals** all have roles to play.
- Many specific policy levers on transboundary environmental impacts of global trade focus on reducing the impact of consumption, rather than **consumption** itself.
- Public policies appear to have limited consideration of the difference between **relative and absolute decoupling** of economic activity from environmental impacts.

- No single approach or policy lever will lead to a reduction in consumption and environmental footprint. Solutions will require a **combination** of levers, stakeholder and citizen engagement, and policy development processes and implementation mechanisms.
- A number of **policy levers** have been proposed, tested or implemented with the aim of reducing impact of domestic production and consumption on natural environments overseas. Examples of these policy levers are summarised in Table Executive Summary 1 (ES 1).
- **Infrastructure** for energy, both fossil fuel and renewable energy, creates opportunities for Scottish business economically and in demonstrating leadership in fields of global relevance.
- Mandatory **due diligence** obligations on businesses can be designed to ensure that businesses mitigate environmental impacts through their supply chains and investments and publicly report their actions. In respect of international supply chain due diligence, to increase the legitimacy of demand-side regulatory actions there is a need for equal engagement with supplier country stakeholders.
- **Statutory target and monitoring frameworks** provide opportunities for legally binding targets to signal emerging policy directions as well as mechanisms to drive legally enforceable behavioural change.
- Changes in **public procurement** through mandatory regulation can impact directly on overall consumption. Green public procurement represents a policy instrument with potential to influence supply chains that sits outwith the domain of international trade.
- It is essential to understand the **power relationships** and **governance** structures that influence policies that aim to reduce consumption: these are contested issues with multiple stakeholder interests.
- **Social justice and equality** aspects require to be considered in developing policies that aim to reduce consumption. The Scottish Government Environment Strategy Outcome Pathway for achieving a sustainable international footprint is intrinsically linked to the outcome 'Our healthy environment supports a fairer, healthier, more inclusive society'.
- Most **certification** frameworks, such as ecolabels, focus on the environmental impacts of the production of goods (e.g. deforestation or biodiversity) but do not consider the social conditions under which they are produced (child labour, gender equality, unionisation). The Scottish Government should explore and support the establishment of a Sustainability Label where social and environmental information are provided to the consumer.
- A **carbon tax** is a tool worthwhile exploring by the Scottish Government. The main barrier may be public acceptance of its suitability, and a limitation is in



dealing with international supply chains and avoiding issues such as double-taxation.

- As an international actor, Scottish policy and business have responsibilities to ensure that consumers have access to imported goods and services that were produced under **ethical and sustainable conditions**. This includes ensuring that fair wages have been paid, that the environment has been protected, and that farmers have access to long-term contracts.

**Table ES 1.** Specific policy levers for a sustainable global footprint

Regulatory Levers	Economic Levers	Infrastructure-based Levers	Information-based Levers
<ul style="list-style-type: none"> <li>• International/multi-lateral agreements</li> <li>• Mandatory due diligence obligations</li> <li>• Statutory targets</li> <li>• Mandatory public procurement requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Taxation – border adjustment taxes, carbon taxes, commodity taxes</li> <li>• Sustainable commodity import guarantees</li> </ul>	<ul style="list-style-type: none"> <li>• Reuse infrastructure</li> <li>• Reduce the consumption of raw materials infrastructure through circular practices</li> </ul>	<ul style="list-style-type: none"> <li>• Certifications and eco-labelling</li> <li>• Capacity building</li> </ul>

## 4. Introduction

### 4.1 Aims and objectives

The Environment Strategy creates an overarching framework for Scotland's policies on the environment and climate change. One of its key aims is to support a whole-of-government approach to tackling the climate and nature emergencies. The strategy was placed on a statutory basis by the [UK Withdrawal from the European Union \(Continuity\) \(Scotland\) Act 2021 \('the Continuity Act'\)](#), with Section 47 requiring Scottish Ministers to prepare and publish an environmental policy strategy.

The Scottish Government is taking a phased approach to developing the Environment Strategy. Its [vision and outcomes](#) were published in 2020, followed by an [initial monitoring framework](#) and [website](#) for tracking progress towards these outcomes, published in 2021. Progress reports to update the Scottish Parliament were published in March [2022](#) and [2023](#). The current and final phase is to develop 'outcome pathways', identifying actions and priorities across government for driving progress towards the strategy's outcomes.

**One Earth. One home. One shared future.**

**By 2045: By restoring nature and ending Scotland's contribution to climate change, our country is transformed for the better – helping to secure the wellbeing of our people and planet for generations to come.**

The strategy's outcomes are designed to provide focus for the efforts of the Scottish Government and partners when working to deliver the vision, summarised above.

Three of the outcomes describe the Scottish Government's ambitions for the environment, focusing on nature, climate change and sustainable resource-use:

- Scotland's **nature** is protected and restored with flourishing biodiversity and clean and healthy air, water, seas and soils.
- We play our full role in tackling the global **climate** emergency and limiting temperature rise to 1.5°C.
- We use and re-use **resources** wisely and have ended the throw-away culture.

There are established policies and strategies in these areas - the Environment Strategy sets an overall framework for these and explores synergies between them.

The remaining three outcomes describe wider ambitions for Scotland's economy, society and global citizenship – drawing out connections with wider government policies:

- Our thriving, sustainable **economy** conserves and grows our natural assets.
- Our healthy environment supports a fairer, healthier, more inclusive **society**.
- We are responsible global citizens with a sustainable **international footprint**.

The Environment Strategy recognises that playing Scotland part in tackling the climate and nature emergencies will rely on transformative changes across Scotland's economy and society, based on a just transition. In turn, this can help to achieve wider goals for the health and wellbeing of Scotland's people and the resilience of our economy.

This report aims to support the development of the Environment Strategy by providing evidence to help inform the development of a 'pathway' for achieving the following outcome:

**We are responsible global citizens with a sustainable international footprint.**

This outcome focuses on the sustainability of Scotland's consumption and production, in relation to the international environmental impacts associated with these activities. It is concerned specifically with Scotland's impact on the natural environment in other countries, on which Scotland relies for raw resources and materials, including biodiversity loss, ecosystem degradation and associated loss of ecosystem services.

The objective of this report is to identify examples of international best practice in relation to policy levers for achieving a sustainable international footprint. The review was conducted by placing the policies within the context of land use, land use change and pollution. International best practice examples include those of how other countries are using different policy levers to reduce their international footprint, policy recommendations drawn from the international literature, and current projects in Scotland that highlight current good practices.

The report contributes to a wider project led by the [Global Footprint Network](#), with contributions from the [Joint Nature Conservation Committee \(JNCC\)](#), which aims to measure Scotland's current international environmental footprint and provide recommendations on policy levers to drive progress towards delivering the outcome “*We are responsible global citizens with a sustainable international footprint*”.

## 4.2 Context – transboundary spillovers

Existing supply chains in current globalised economies highlight the reliance of countries such as the UK on land, resources (Hawker *et al.*, 2020) and people beyond national boundaries, with a particular negative effect on the Global South. According to a JNCC report (Hawker *et al.*, 2020), half of the food consumed in the UK was produced domestically, with 30% imported from the EU and the remaining 20% from other nations. Such a dependence on global supply chains for everyday life should lead to reflections on the consequences (spillovers) that consumption has on the land being used for the food being consumed, and on the conditions in which farmers, workers and communities produce it.

Scotland's resource-use in context:

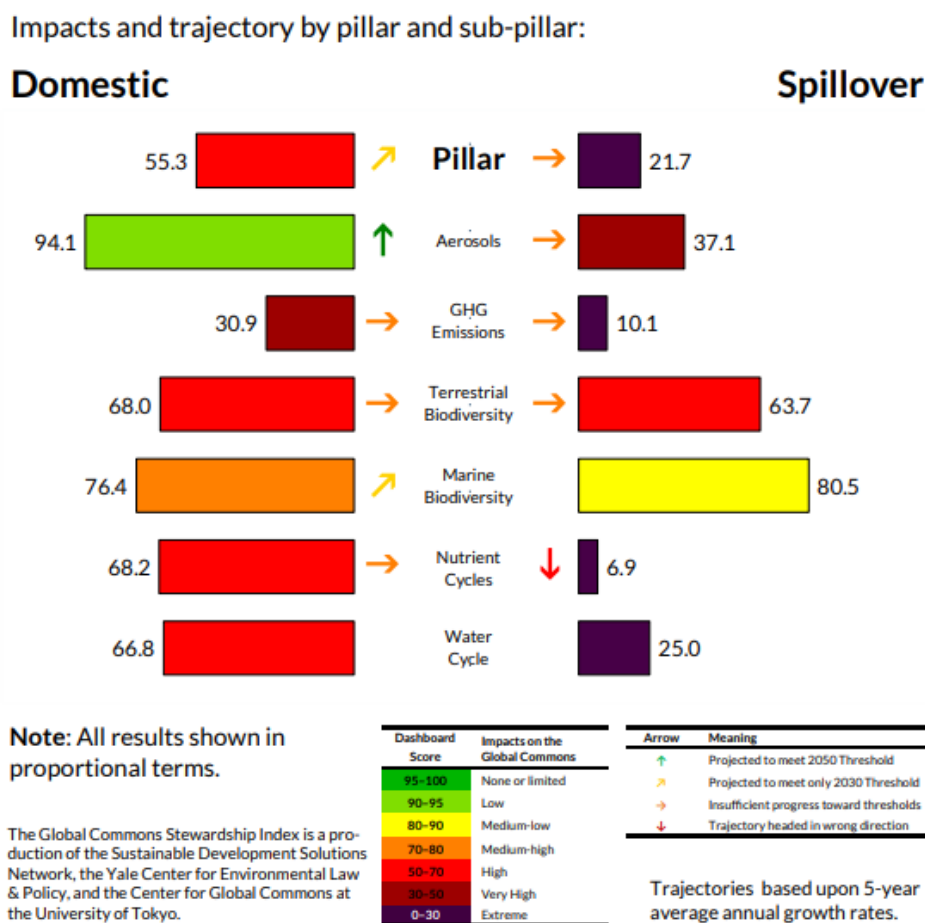
- Scotland's per capita material footprint is 21.7 tonnes per year (117.8 million tonnes in total), nearly double the global average of 11.9 tonnes, almost three times what's considered a sustainable level.
- Scotland extracts 22.8 tonnes of material per person per year within our borders, 60% of which comes from fossil fuels. The UK average is 5.5.
- Over 98% of Scotland's material use stems from virgin sources.
- Only 1.3% of the resources Scotland uses are cycled back into the economy after use.
- The average person in Scotland is responsible for 13.8 tonnes of greenhouse gas (GHG) emissions per year – one-third more than the average UK resident, with a carbon footprint of 10.3 tonnes per capita.

Source: [CGR Scotland \(circularity-gap.world\)](#)

There is an increasing academic and policy interest in understanding the interconnected social, economic and environmental consequences of supply chains (see Benzie *et al.*, 2016; Mahmood 2022, Dzebo & Adams, 2022; OECD/EC-JRC 2021; Hawker *et al.*, 2020; ECLAC/ILO 2016), as well as a range of approaches to measuring impacts across supply chains and across international borders.

The Centre for Global Commons (Ishii *et al.*, 2022) framework argues that Earth's systems are the "foundation of human development and prosperity", and therefore they constitute the "Global Commons". Built under the notion of the Anthropocene, when humans have become a force of nature capable of influencing the earth's natural changes (Latour, 2014; Allen *et al.*, 2018), the argument is that when the global commons do not operate in a stable manner, they increase the likelihood of threats including forced migration and conflict. This destabilisation of ecosystems has been enhanced by a linear economic model in which consumption is completely detached from the "externalities" it has caused. Therefore, final consumers are disengaged from how their goods and services were produced, including farming, manufacturing and the provision of services.

The [Centre for Global Commons](#) (at the University of Tokyo) published the [Global Commons Stewardship Index](#) in 2021, which measured the environmental consequences, both internal and international, of consumption in 100 countries. The results showed that while the UK pollutes very little through aerosols (SO<sub>2</sub>, NO<sub>x</sub>, Black Carbon) within its borders, it is one of the biggest emitters worldwide when the measure considered is of the amount of aerosols emitted during the production of goods for the UK market.



**Figure 1.** UK domestic and spillover effects of trade by environmental issue (pillar) (source: [Sustainable Development Solutions Network](#) (SDSN) *et al.*, 2021:266)

Figure 1 shows an analysis of the UK's domestic and spillover pollution for multiple issues, presenting the level of impact on global commons, and their trajectories over a 5 year average annual growth rate.

The prosperity of rich countries is often associated with the burden of unsustainable practices in developing countries. For example, while trade is an important source of income, the production of goods destined for richer nations can often lead to pollution of communities around manufacturing plants, drive deforestation, reduce soil fertility and be done under poor labour conditions. Therefore, the consumption of goods in Scotland can have consequences elsewhere (Ishii *et al.*, 2022).

For a wellbeing economy, Scotland requires to ensure that those places and people making its lifestyle possible also enjoy an appropriate level of wellbeing. That includes understanding and tackling spillover impacts covering the environment, and social and economic rights.

## 5. Method

### 5.1 Review approach

The approach taken has been to undertake a rapid literature review consisting of two parts:

#### **Part 1: Global overview**

The initial approach was to gain a broad overview of relevant policy approaches and levers through a review of selected grey and academic literature related to ecological and material footprints, consumption, and impacts such as deforestation, land use change and pollution. Initially, sources were identified based on the existing knowledge of the research team and Scottish Government colleagues, supplemented by targeted searches using terms related to the impacts of interest and policy levers identified in the initial sources reviewed. This approach was adopted due to the tight timescale for the review, especially given the wide-ranging scope of the work. Future research seeking to map the evidence base could focus on specific areas of interest highlighted in this report, using more systematic (and therefore resource-intensive) review methods.

#### **Part 2: Examples of best practice**

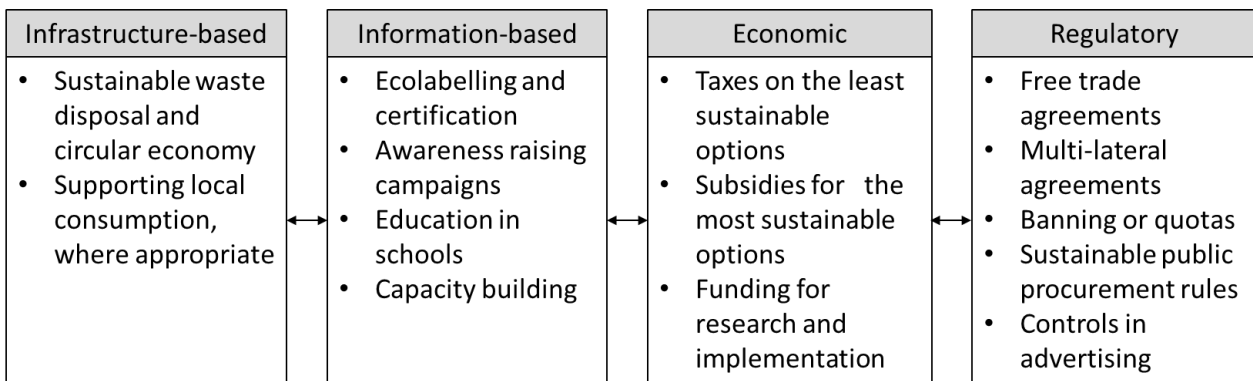
Drawing on the existing knowledge of the research team and examples highlighted in the literature reviewed in Part 1, examples or case studies were identified that illustrated the implementation of policy levers in international contexts. These examples vary in length and depth depending on the availability of evidence. While the specification for this research called for examples of 'best practice', it is noted that it was not possible to evaluate the effectiveness of the case study policies or interventions profiled (see 'Defining best practice' section below).

### 5.1.1 Conceptual frameworks

This review forms one part of wider work on the overseas environmental footprint of Scotland's consumption (led by Global Footprint Network, GFN). Where possible, this review of the literature and international best practice examples aligns with two frameworks being used in the GFN research project:

- i) **Policy levers for reducing consumption** categorised as: *infrastructure-based, information-based, economic and regulatory*, produced by the [Joint Nature Conservation Committee](#) (JNCC; Harris, 2023; Figure 2).
- ii) **Consumption domains** for the assessment of Scotland's international footprint (GFN). That footprint is measured at the household consumption level through five elements: *food; shelter/housing; mobility; goods; and services*.

**What?** Which policy levers can be used by government to improve the sustainability of consumption?



**Figure 2.** Framework of policy levers (Harris, 2023).

### 5.1.2 Scope of review

Given the scale of the challenge to achieve sustainability and reduce the environmental impact of consumption to a level within planetary boundaries (a 'wicked problem'<sup>1</sup>), the scope of this review is confined to summary level assessments of policy levers in relation to the GFN consumption domains and policy lever types (Harris, 2023).

Achieving a sustainable international footprint requires the reduction of consumption in line with global environmental limits. This broad aim of achieving a sustainable level of consumption has relevance to several (if not all) of the Scottish Government's Environment Strategy outcomes. In particular, there is significant common cause between the achievement of a sustainable international footprint (also referred as, Global Footprint outcome) and that of: 'We use and re-use

<sup>1</sup> There are numerous definitions of a 'wicked problem'. In this report we use: "A wicked problem is a problem, usually social or cultural, that is challenging or impossible to solve either because not enough is understood about the problem, the number of stakeholders involved, the number of varying opinions, the economic burden, or the impact of these problems with other problems" <https://wicked-problem.press.plymouth.edu/chapter/what-is-a-wicked-problem/>

resources wisely and have ended the throw-away culture' (also referred as, Resource-use outcome).

The development of pathways for other outcomes are the subject of separate work. Therefore, we acknowledge the contribution of reducing overall material footprints as part of reducing Scotland's overseas environmental impact, but do not set out a comprehensive review of the extensive literature on policy interventions to reduce material consumption across all the 5 domains of consumption identified by GFN through their Consumption Land Use Matrix (see Figure 3).

### Consumption Land Use Matrix

	Built-up Land	Carbon Footprint	Cropland	Grazing Land	Forest Land	Fishing Ground	Total
Food							
Shelter							
Mobility							
Goods							
Services							
<b>Total</b>							

**Figure 3.** GFN Consumption Land Use Matrix (Source: GFN, no date)

**A sustainable global footprint involves reducing Scotland's GHG emissions, water waste, ending loss of habitat, minimising land use impacts on soil fertility etc., and increasing fair wages, gender equality, labour rights, and the living conditions of those producing what is consumed.** These effects should be ensured within Scotland's borders, and for those involved in global supply chains. In this report we refer to reducing GHG emissions, given this is an important component of Scotland's global environmental impact, whilst recognising that carbon emissions reductions and net zero policy are the domain of the Climate Change Plan (also reflected in the strategy's outcome "*We play our full role in tackling the global climate emergency and limiting temperature rise to 1.5°C*"), rather than the Environment Strategy Outcome Pathway for becoming responsible global citizens.

Given these considerations, the **focus** here is primarily **on policies to reduce environmental impacts overseas as a result of Scotland's consumption and production.** These are particularly in relation to land use and land use change (including deforestation, loss of habitats, women's power in decision making around land), and pollution impacts. The water footprint associated with imported



commodities also forms part of the environmental impacts of consumption. The timescale for reporting limited work on this topic.

The information is presented in the knowledge there are a wide range of concepts of sustainability that will be viewed differently depending on socio-cultural beliefs, political perspectives and the perspectives of economic models, all of which will vary between countries. The evidence and examples in the report are also with the awareness that there is a fundamental difference between reducing consumption and changing consumption to reduce the ecological footprint.

### 5.1.3 Defining 'best practice'

What constitutes 'best practice' in policies varies depending upon the context. In respect of planning, Blake *et al.* (2021) offer the definition "Best practices are prevalent in all fields of planning and act to highlight effective and implementable examples, set standards, and generally assist 'evidence-based' policy-making. In doing so, they frame what futures are desirable and play a role in shaping the planned environment." This definition promotes the need for clarity of purpose, standards to which to be adhered (and monitoring mechanisms to assess progress), and evidence to support the process and content of policy formulation.

Best practice can encompass the approach taken to developing and implementing new policies in respect of the timeline of anticipated benefit; the nature of engagement with the public and other stakeholders; and understanding and taking account of the governance and power relationships amongst stakeholders during processes of co-construction of solutions. This is important in reducing consumption when the scale of ambition is a contested issue.

In the findings of this review we have, where possible, provided case studies that highlight the implementation of policy levers in international contexts. These case studies aim to illustrate 'effective and implementable examples' as per the definition of 'best practice' above. However, for the most part, this does not include an assessment of the actual impacts of the policy instruments or interventions profiled. For this reason, we use the term 'case study' rather than 'best practice example'.

## 6. Findings Part 1: International policy perspectives on reducing international impacts of Scotland's consumption and production

Part 1 of the findings of this review provides a high-level overview of policy approaches and perspectives relevant to how Scotland can reduce the international impacts of its consumption and production. Part 2 discusses specific policy levers identified in the literature, supported by international case studies of their implementation.

### 6.1 Reducing consumption versus reducing impacts of consumption

When considering policy mechanisms to reduce a country's international footprint it is appropriate to distinguish between policies that focus on reducing the *impacts* of consumption and those that seek to reduce consumption in absolute terms. Many



of the specific policy levers (see Part 2) highlighted in literature on transboundary environmental impacts of global trade focus on reducing impacts of consumption, for example through substitution of commodities associated with impacts such as deforestation with more sustainable alternatives. However, **to be 'responsible global citizens' and bring Scotland's and the world's footprint within planetary boundaries, fundamental changes to overall consumption levels are required** (Akenji *et al.*, 2021; Jackson, 2009a, b).

The UK Government 25 Year Environment Plan published in 2018 (UK Government, 2018) sets out aspirations and plans to place "agriculture, forestry, land use and fishing that puts the environment first", including the protection and improvement of the global environment. The Plan recognised a need to provide international leadership and to lead by example, leaving a lighter footprint on the global environment. It included a commitment to "to identify actions across supply chains that will improve the sustainability of food and forestry products and reduce deforestation". In following-up this commitment, the UK Government launched the UK Global Resource Initiative (2020), an industry-led grouping set up to provide recommendations on "how the UK and international partners can increase trade in sustainable commodities and reduce the deforestation impact of UK supply chains."

There is a consensus amongst climate change scholars, practitioners and activists of a need for systemic and transformational change to achieve the necessary level of reduction in emissions (IPCC, 2023; ICAT, 2020; Fanning *et al.*, 2022). The Initiative for Climate Transparency defines transformational change as:

*"A fundamental, sustained change of a system that disrupts established high-carbon practices and contributes to a zero-carbon society, in line with the Paris Agreement goal to limit global warming to 1.5-2°C and the United Nations Sustainable Development Goals"* (ICAT, 2020:15).

This type of change can be distinguished from other approaches to change (i.e. incremental change and reform) which centre on adjusting aspects of the business-as-usual scenario, or reforming certain aspects of the system (e.g. imposing an environmental tax on a specific area of consumption), but that fail to fundamentally change the system as a whole.

There are significant contradictions between the aim of reducing consumption and operating within an economic system that is dependent on the growth of economic activity (driven by consumption) in order to maintain economic structural integrity under current dominant economic models (Walker *et al.*, 2021). Reducing consumption *per capita* may not be sufficient alone if the environmental and social impact of the production process is not improved (Castleman, 1979). That is, **reducing the ecological footprint of consumption is different from reducing consumption**. There is a need to recognise that a drive for increased efficiency can result in a net overall increase in economic activity leading to greater resource use, which is a risk recognised by Jevons (1871), referred to as Jevons' paradox.

Questions arise of social justice and equality as to how policies to reduce consumption might impact on those who would benefit from such an increase. For

a large proportion of the global population there is a need to increase consumption, e.g. meat and eggs to improve the diet of citizens who are under-nourished; construction materials to improve housing conditions; clothing to enhance wellbeing (Bhar, 2023; Walker, 2012).

Individuals differ with respect to their perceptions of risk, lifestyle choices, understanding of needs for reducing consumption and the requirements for behaviour change. A challenge in designing approaches that rely on behavioural change is recognising that decisions of individuals which are based upon perceptions of risk are not necessarily rational or independent of topic. Individuals may auto-compensate by reducing consumption of one resource and justify additional consumption of another.

The rationale and approach to reducing consumption will vary depending on the conceptual 'lens' used to view the issues. There are multiple tools and concepts with which to assess and develop alternative economic models that have sustainability as their overall objective. Examples of these tools and concepts are Ecological Footprint and Biocapacity; Life Cycle Assessment; Societal Metabolism (e.g. Viglia, *et al.*, 2017); Doughnut Economics (Raworth, 2012, 2017; DEAL, 2023); Planetary Boundaries (Rockström *et al.*, 2009); and Prosperity Without Growth (Jackson, 2009a).

Organisations, institutions and businesses have different perspectives, motivations and levels of influence on discourses on issues relating to resource uses and their consequences on the environment, and mechanisms for driving or informing policy, including the timescales for changing consumption. The economic concept adopted for informing how to achieve the aim of reducing consumption is likely to comprise a combination of socio-cultural, economic and political backgrounds, developmental objectives and ideological perspective (i.e. capitalism, socialism, wellbeing based).

Countries, organisations and businesses which are transforming their approach to consumption (e.g. substituting inputs) have responsibilities towards countries that have developed a dependency on their roles within supply chains which cease or in which substitution removes those roles (e.g. Berger & Polack, 2019).

### 6.1.1 Relative and absolute decoupling

Relative and absolute decoupling is an important concept in respect of understanding the relationship between efforts to reduce consumption and the scale and intensity of resource use and whether a net reduction can be achieved.

**Relative decoupling** refers to a decline in the ecological intensity per unit of economic output, e.g. resource impacts decline relative to GDP as it grows.

**Absolute decoupling** refers to a situation in which resource impacts decline in absolute terms. Resource efficiencies must increase at least as fast as economic output does and ecological intensity (footprint) must continue to improve as the economy grows, if absolute decoupling is to occur (adapted from Jackson, 2009a, b).

Whilst relative decoupling implies doing more with less and being more efficient with the resources available, there is a risk that overall resource consumption can increase due to additional demand from a growing and more affluent society. Relative decoupling only really measures the resource use per unit of economic output and implies that resources are unlimited. For relative decoupling to cope with the problems of growth in population and affluence, resource efficiencies must increase at least as fast as economic output. However, perpetual economic growth under continuous growth in population and affluence, even if a comparable rate of relative decoupling is achieved, does not recognise the ecological limits of the Earth's ecosystems.

**To remain within the Earth's ecosystems capacity** (i.e. Planetary Boundaries, see Rockström *et al.*, 2009), **it is necessary to achieve absolute decoupling: a point of balance between resource availability and renewal and economic activity** (often referred to as "living off nature's interest rather than its capital"). With a growing population and increasing income, absolute decoupling will occur only when the rate of relative decoupling is greater than the rates of increase in population and income combined (adapted from Jackson, 2009a). Without recognising the need for absolute decoupling, there is a risk of encountering the 'Jevons Paradox', whereby greater efficiency in resource use leads to an overall net increase in resource use due to increases in demand from population and affluence growth.

A key finding from this review is that policies aiming for either reduced consumption and/or reduced environmental footprint are primarily focused through resource efficiencies and are hence limited to relative decoupling only.

#### 6.1.2 Early examples of international consumption reduction strategies

**UNEP Sustainable Consumption and Production (SCP)**: This was an early, innovative, step by the [United Nations Environment Programme](#) to address some of the challenges for achieving sustainability. The SCP was focused upon decoupling economic growth from environmental degradation, increasing resource efficiency and promoting sustainable lifestyles. It took a holistic approach to systemic change and was built around three main objectives:

- **Decoupling environmental degradation from economic growth**: 'doing more and better with less', increasing net welfare gains from economic activities by reducing resource use, degradation and pollution along the whole life cycle, while increasing quality of life. 'More' is delivered in terms of goods and services, with 'less' impact in terms of resource use, environmental degradation, waste and pollution.
- **Applying life cycle thinking to increase the sustainable management of resources and achieving resource efficiency** throughout both production and consumption phases of the lifecycle, including resource extraction, the production of intermediate inputs, distribution, marketing, use, waste disposal and re-use of products and services.

- **Seizing opportunities for developing countries to contribute to poverty eradication** and the achievement of the UN Millennium Development Goals (superseded by the 2030 Agenda for Sustainable Development and the associated Sustainable Development Goals, SDGs). For developing countries, the SCP identified opportunities such as the creation of new markets, green and decent jobs as well as more efficient, welfare-generating natural resource management. It identified an opportunity to “leapfrog” to more resource efficient, environmentally sound and competitive technologies, bypassing the inefficient, polluting, and ultimately costly phases of development followed by most developed countries.

Whilst innovative, ambitious and successful in some of its goals, arguably the SCP failed to fully recognise the challenges of the differences between relative and absolute decoupling. However, it helped to embed the concepts of decoupling into mainstream thinking.

## 6.2 Sectoral policy approaches

This section covers examples of background issues and policy approaches. Its structure aligns with the consumption domains used by Global Footprint Network (GFN) with a particular focus on Food, Goods and Services. These domains are prioritized due to their direct impacts on natural environments overseas through international trade.

### 6.3 Focus area: food

**Background:** The role of human diet choices and consumption rates, energy used and how the food system operates has a substantial effect on health, land uses, habitat and biodiversity loss and GHG emissions. For example, globally the food system represents c. 34% of all GHG emissions (Crippa *et al.*, 2021). The largest contribution came from agriculture and land use/land-use change activities (71%) with the remaining from supply chain activities: retail, transport, consumption, fuel production, waste management, industrial processes and packaging.

Tubiello *et al.* (2022), estimated that total GHG emissions from the food system were about 16 CO<sub>2</sub>eq yr<sup>-1</sup> in 2018, approximately one-third of the global anthropogenic total. Importantly in respect of reducing consumption, three quarters of these emissions, 13 Gt CO<sub>2</sub>eq yr<sup>-1</sup>, were generated within the farm gate or in pre- and post-production activities, such as manufacturing, transport, processing, and waste disposal. The remainder of the emissions were generated through land use change at the boundaries of conversion of natural ecosystems to agricultural land. Pre- and post-production emissions were proportionately more important in high-income than in low-income countries. Between 1990 and 2018, emissions from land use change across all countries decreased while pre- and post-production emissions increased. Tubiello *et al.* (2022) report results on a per capita basis, showing that world total food systems per capita emissions decreased during 1990–2018 from 2.9 to 2.2t CO<sub>2</sub>eq cap<sup>-1</sup>, with per capita emissions in 2018 in developed countries approximately twice those in low income countries.

**Diet and land use:** The EAT-Lancet report (Willett *et al.*, 2019) highlights the imbalance in human diet and the need for reduced consumption of some food goods but increases in others: *“Transformation to healthy diets by 2050 will require substantial dietary shifts. Global consumption of fruits, vegetables, nuts and legumes will have to double, and consumption of foods such as red meat and sugar will have to be reduced by more than 50%. A diet rich in plant-based foods and with fewer animal source foods confers both improved health and environmental benefits”*.

The dichotomy of needing to reduce consumption of meat whilst increasing consumption of fruit and vegetables has substantial consequences on land use and management. In the UK, approximately 85% of farmland is used to feed livestock but this provides only 32% of the calories we eat, whilst the 15% of farmland that is used to grow plant crops for human consumption provides 68% of our calories. Over consumption of meat is a direct cause of diet related health issues. The UK Climate Change Committee recommended reducing consumption of high-carbon meat and dairy products by 20% by 2030, with further reductions in later years to reduce GHG emissions and protect natural ecosystems. Such substantial behaviour changes are likely to have significant impacts on land use in the UK and elsewhere, and on trade in food and livestock feeds. The UK Food Strategy (Dimbleby 2020, 2021) made recommendations on dietary change for human health and environmental sustainability and the need for food system and land use transformations. The report recommends meat consumption is cut by 30% within a decade.

The Dimbleby recommendations have only partially been acted upon in developing a food strategy and eventually legislation in England Wales. The recent Scottish Government Good Food Nation Bill places a strong emphasis on the need for healthy diets and sustainable food production. The UK Eatwell Guide is a policy tool used to define UK government recommendations on eating healthily and achieving a balanced diet. Based on the Eatwell Guide, estimates have been made of the land area required for food production to provide a healthy diet (e.g. in the UK by Williams *et al.*, 2017, and GHG reductions by Rivington *et al.*, 2021). However, this remains an under researched area.

### 6.3.1 Food consumption reduction policies

**Health focussed:** Food oriented policies have generally focused on people's health rather than environmental goals. However, there are parallels between the objectives for consumption reduction for environmental benefits and improving health. The goal of the World Health Organisation's Global Action Plan For The Prevention and Control of Noncommunicable Disease, for example is *“To reduce the preventable and avoidable burden of morbidity, mortality and disability due to noncommunicable diseases by means of multisectoral collaboration and cooperation at national, regional and global levels, so that populations reach the highest attainable standards of health and productivity at every age and those diseases are no longer a barrier to well-being or socioeconomic development”* (WHO, 2020).

This strategy uses key overarching principles, which resonate with objectives for reducing consumption and environmental footprints:

- Life-course approach
- Empowerment of people and communities
- Evidence-based strategies
- Universal health coverage
- Management of real, perceived or potential conflicts of interest
- Human rights approach
- Equity-based approach
- National action and international cooperation and solidarity
- Multisectoral action

An estimated 36 million deaths, or 63% of the 57 million deaths occurred globally in 2008 due to non-communicable diseases, comprise cardiovascular diseases (48%), cancers (21%), chronic respiratory diseases (12%) and diabetes (3.5%). These major non-communicable diseases share four behavioural risk factors: tobacco use, unhealthy diet, physical inactivity, and harmful use of alcohol. Approaches to reduce these health risks highlight lessons learned on the importance of engaging with multiple actors, and the potential conflicts arising from power relations and vested interests. For example:

*“While deaths from noncommunicable diseases mainly occur in adulthood, exposure to risk factors begins in childhood and builds up throughout life, underpinning the importance of legislative and regulatory measures, as appropriate, and health promotion interventions that engage State and non-State actors from within and outside the health sectors, to prevent tobacco use, physical inactivity, unhealthy diet, obesity and harmful use of alcohol and to protect children from adverse impacts of marketing” (WHO, 20013:29)*

### 6.3.2 Linking human health and environmental protection

Recognition is increasing of the co-benefits of integrating objectives for human health and wellbeing with those of environmental protection and enhancement (Dimbleby 2020, 2021; WHO 2020; Dasgupta, 2022). In 2019, the Food and Land Use Coalition (FOLU) published “The Global Consultation Report” calling for the urgent transformation of the global food and land use systems by 2030. The report called for recognition that the provision of healthy diets requires ensuring that farmers have access to better lives as a result of fair payments for their work and that women have more power for decision-making. FOLU (2019) forecast that under current trends, by 2050 there will be a 70% increase in food production, with effects on food prices, land and water requirements and the environment. However, FOLU (2019) note this is possible under the improvement of food supply chains (lower food loss and waste) and a reduction of meat-based proteins. It is important to highlight that negative behaviours such as food waste tend to be more common in parts of the Global North, while the benefits of behavioural changes, including demand for



agricultural land, could be experienced in the Global South (p. 192). Making these changes is a matter of environmental and social justice where spillover effects could be reduced.

**EU Farm to Fork Strategy:** The EU Farm to Fork Strategy (European Commission, 2020a) is part of the European Green Deal (European Commission, 2019a), an aim of which is to make food systems fair, healthy and environmentally friendly. It is aligned with the 2030 EU Biodiversity Strategy, with the two proposals presented as complementary. In its multiple elements (see Figure 4) the Farm to Fork Strategy seeks to accelerate the transition to a sustainable food system that should:

- Have a neutral or positive environmental impact.
- Help to mitigate climate change and adapt to its impacts.
- Reverse the loss of biodiversity.
- Ensure food security, nutrition and public health, making sure that everyone has access to sufficient, safe, nutritious, sustainable food.
- Preserve affordability of food while generating fairer economic returns, fostering competitiveness of the EU supply sector and promoting fair trade.



**Figure 4.** Schematic of the Farm to Fork strategy

Further aims to be achieved by 2030 include, a 50% reduction in the use of chemical pesticides and the most hazardous pesticides, reduce fertilizers by 20%, reduce sales of antimicrobials for farmed animals and in aquaculture by 50%, and at least 25% of the EU's agricultural land under organic farming. It promotes a circular, "bio-based" economy and the use of food waste as fertilizers, animal feed and bioenergy. It proposes legally binding targets for reducing food waste. The Strategy requires the European Commission to formulate rules to reduce dependency on soya, and to promote the use of alternative feed materials, and promote EU-produced plant-based proteins to consumers.

The Strategy contains a contingency plan for ensuring food supply and food security as a precaution against impacts of disruptions of significant magnitude, such as COVID-19. It claims to support the transition to sustainable agri-food systems through EU trade policies and international cooperation instruments.

The Farm to Fork Strategy is ambitious and innovative and seeks to be integrative with other policy areas (i.e. by directly linking to the [EU Biodiversity Strategy for 2030](#), European Commission, 2020b). However, some of the reforms have met resistance from stakeholders including farmers, politicians, country representatives and EU officials (Wise, 2023). Criticism directed at the strategy (e.g. from the animal feed sector) are illustrative of challenges facing achievement of an aim of reducing meat consumption whilst increasing plant-based proteins.

Concerns of some stakeholders about the EU Farm to Fork Strategy, particularly those who perceive the greater threats to their interests, reflect the dilemmas of aiming to address urgent challenges that require transformative change. This highlights issues discussed above about the different scales and focus of perception of risk. Some stakeholders fear change that has negative impacts on their interests, which may detract from an understanding and appreciation of larger scales of risks, such as climate change, biodiversity, health and overall stability of the agri-food system and protection of food security.

### 6.3.3 Monitoring policies relating to human food and health

The International Network for Food and Obesity/Non-communicable Diseases (NCDs) Research, Monitoring and Action Support (INFORMAS) Healthy Food Environment Policy Index (Food-EPI) is an example of monitoring of the implementation of a policy on healthy food. The Food-EPI was developed to evaluate the degree of implementation of widely recommended food environment policies by national governments compared to international best practice. It was applied in New Zealand in 2014, 2017 and 2020, comparing policy implementation and recommendations with the 2014 and 2017 Food-EPI. Experts rated the extent of implementation of 47 indicators of “good practice” policy and infrastructure support compared to international best practice. Then they proposed and prioritized specific actions which were needed to address the critical implementation gaps identified (Mackay *et al.*, 2022).

## 6.4 Focus area: goods and services

### 6.4.1 Transition to a circular economy

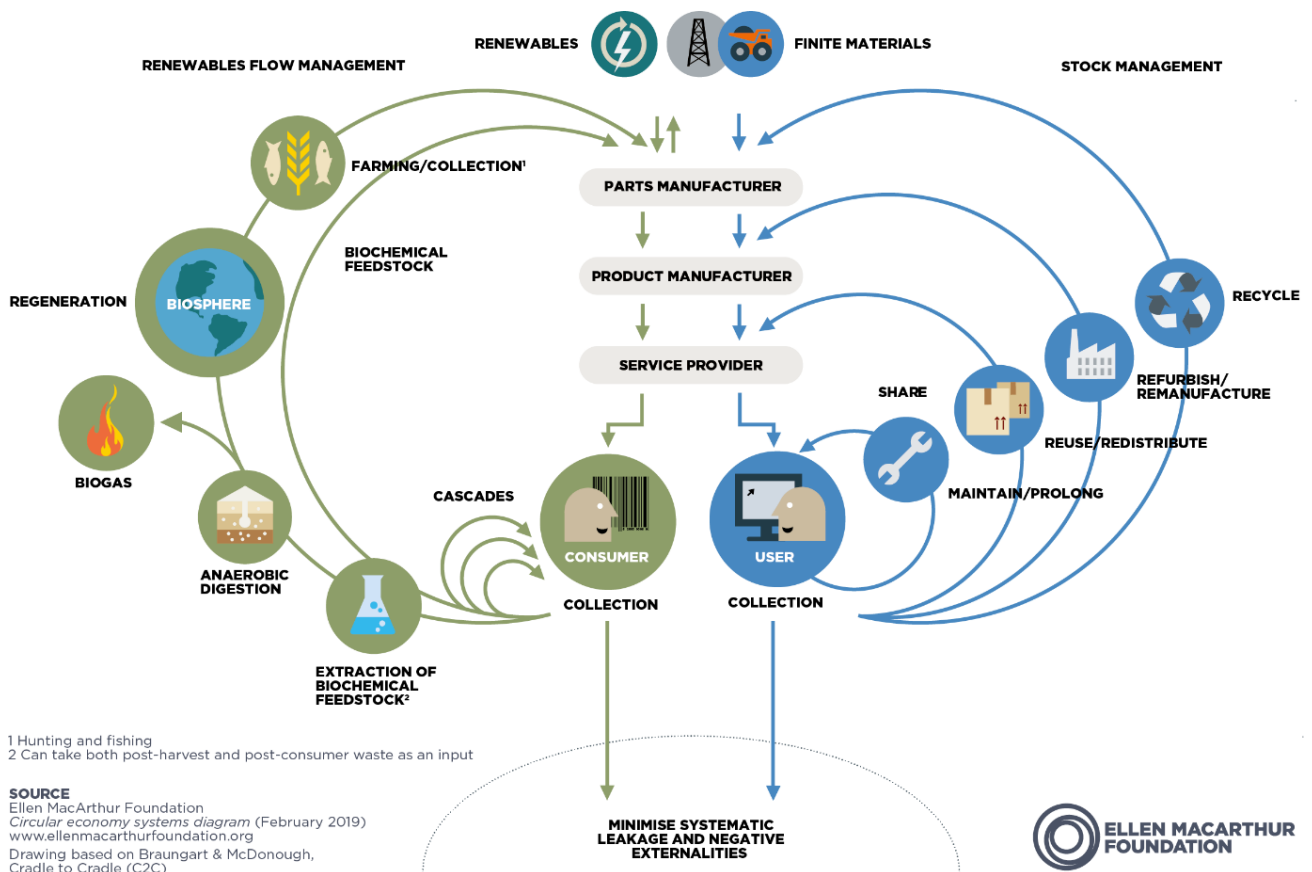
Reducing the consumption of primary resources is an immediate and pressing priority in policies across Europe and beyond. Reducing resource use is necessary to halt the degradation of the natural environment and to facilitate transitions to climate neutrality, in line with the Paris Agreement’s commitment to limit global climate change to well below 2°C. To do this, administrations are seeking to facilitate a transition away from the traditional, linear ‘take, make and dispose’ economic model to a Circular Economy (CE) model.



Within the linear model, raw materials are extracted, used to produce goods which are used/consumed, and then, at the end of their product life, are disposed as waste. In the CE model, the aim is to reduce resource inputs and waste outputs by keeping resources and materials circulating in the system. There is no one agreed definition or interpretation of the circular economy, with the review by Kirchherr *et al.*, 2017 reporting 114 definitions in use. However, a common theme is that in a circular economy materials and resources that might have been disposed of as waste are recirculated through the addition of different processes (loops) which include reducing material use including through design; reuse and repair of products; and recycling and recovery of resources. Interpretations of the CE often fail to pay sufficient attention to the systemic shift required to transition to a CE, with efforts focusing less ambitiously on recycling and incremental measures rather than taking a systems perspective (Kirchherr *et al.*, 2017). Furthermore, research on CEs has tended to focus on industrial and technical production-side problems, however everyday consumption and waste-related behaviour at the individual- and household-level will play a pivotal role in the success of CE policy (Georgantzis Garcia *et al.*, 2021; Camacho-Otero *et al.*, 2018).

There are different ways of conceptualising and illustrating the Circular Economy. The representation in Figure 5, referred to as 'the butterfly diagram', is produced by the [Ellen MacArthur Foundation](#). It illustrates the continuous flow of materials in a circular economy. There are two main cycles – the technical cycle and the biological cycle. In the technical cycle, products and materials are kept in circulation through processes such as reuse, repair, remanufacture and recycling. In the biological cycle, the nutrients from biodegradable materials are returned to the Earth to regenerate nature.

It is important to note that in addition to the recirculation of materials shown in the butterfly diagram, **reducing or eliminating unnecessary material consumption must be prioritised in the transition to a circular economy.** To realise the full potential of the circular economy requires an absolute reduction in material consumption. However, if the circular economy is to be framed as a radical systemic change then the butterfly diagram does not convey the whole process which will be required.



**Figure 5.** Butterfly diagram showing recirculation of materials in the circular economy (Source: Ellen MacArthur Foundation). Greater resource efficiency is achieved through the shortest (inner) loops. Realising the full potential of the circular economy transition will require not only a shift towards these shorter loops, but also an absolute reduction in material consumption.

Activities within the CE are commonly conceptualised within frameworks that broadly correspond to the waste hierarchy, as set out in the EU Waste Framework Directive (European Commission, 2008), with activities organised according to their desirability (e.g., Reike *et al.*, 2018; Maitre-Ekern & Dalhammar, 2019). Such hierarchies are dominated by what may be referred to as R-imperatives or R-terms. The most widely recognised of these are 'reduce', 'reuse' and 'recycle', however Reike *et al.* (2018), in a review of the subject, recorded 38 different 're-' words in use in the academic literature relating to a circular economy.

Table 2 shows an integrated framework representing the main R-terms discussed in relation to the circular economy. Attention should be paid to the hierarchical nature of different circular processes to maximise the environmental benefits of moving towards a more circular economy. This means that efforts should focus on activities higher up the hierarchy (see R0-R4 in Table 2), prioritising the reduction in consumption and maximisation of product lifespans over less impactful activities such as recycling.

**Table 2.** Hierarchical framework of circular processes (adapted from Reike *et al.*, 2018, for work in project in the Scottish Government Strategic Research Programme 2022-27, project JHI-C4-1 on the circular economy).

Loop Length	R-terms	Description
<b>Short loop Rs</b> (product remains close to its user and function)	R0: Refuse	Refraining from buying
	R1: Reduce	Using less, retaining for longer, sharing use of products
	R2: Resell/reuse	Buying or receiving second hand items, selling or passing on items for reuse
	R3: Repair	Making a product work again by repairing or replacing parts
<b>Medium loop Rs</b> (products are upgraded and producers involved)	R4: Refurbish	Replacing several key modules or components to produce an upgraded product
	R5: Remanufacture	Full disassembly, cleaning and replacement of key modules or components in an industrial process
	R6: Repurpose	Developing new product with a new function using components of an old product
<b>Long loop Rs</b> (products lose their original function)	R7: Recycle	Processing of waste streams (e.g. through shredding, melting) to capture materials for the production of new products.
	R8: Recover (energy)	Capturing energy embodied in waste, through energy production from incineration or use of biomass
	R9: Re-mine	Recovery of selected materials from landfill (often informally) or minerals from waste

Transitioning to a circular economy is a cornerstone of policy in Europe (e.g. European Green Deal, European Commission, 2019a) and Scotland (e.g. Delivering Scotland's Circular Economy - route map to 2025 and beyond, Scottish Government, 2022). The European Commission's current Circular Economy Action Plan (European Commission, 2020c) includes flagship measures focusing on the regulation of packaging and packaging waste, eco-design of sustainable

products, and construction materials; the introduction of a 'right to repair' for consumers; and proposals to tackle the release of microplastics. It supports delivery of existing EU policies as set out in, for example, the Waste Electrical and Electronic Equipment (WEEE) Directive and the Ecodesign Directive.

#### 6.4.2 International policy on supply chain regulation

**Corporate Sustainability Due Diligence Directive (CSDDD).** This EU Directive, presented on the 23<sup>rd</sup> of February 2022, seeks to “foster sustainable and responsible corporate behaviour throughout global value chains” (European Commission, 2022). The proposal recognises that European companies are embedded in large global supply chains in which the violation of human rights and environmental impacts could occur during the companies' operations, its subsidiaries and in the value chain. While there is a recognition that voluntary reporting has become more widespread across companies, there is no evidence that this resulted in large-scale improvement in reducing negative spillovers from European companies. This lack of legal recognition has limited the certainty for companies and victims in case harm occurs. The Directive addresses:

- Improving governance practices to integrate risk management and mitigation processes of human rights and environmental risks and impacts;
- Harmonising a legal framework across the EU single market;
- Increasing accountability for adverse impacts by ensuring coherence for the obligations of companies under EU laws;
- Improving access to remedies for those affected by negative human rights and environmental impacts caused by corporate behaviour;
- Working in accordance with other EU measures.

These actions should ensure that the business strategies of companies are compatible with limiting global warming to 1.5°C. The Directive applies to both “large EU limited liability companies” and to third country companies (European Commission, 2022), as below:

- **Group 1** Around 9,400 companies with more than 500 employees and a net EUR 150 million+ turnover worldwide.
- **Group 2** Around 3,400 companies in *high-impact sectors* with at least 250 employees and a net EUR 40+ million turnover worldwide. These sectors include textiles, agriculture, extraction of minerals forestry, fisheries, live animals, wood, and the financial sector.
- In the case of **third-country companies** active in the EU, which numbers approximately 2,600 in group 1 and 1,400 in group 2, the rules apply when the threshold is reached through their revenue generated in the EU.
- Micro and SME companies are exempted from these rules, including the [Non-Financial Reporting Directive \(NFRD\)](#)

The rules within this Directive will be enforced by the administrative supervision of a national authority which will impose effective, proportionate and dissuasive

sanctions including fines and compliance orders. Member States will ensure that victims of environmental, or other labour-related, incidents caused by failure of compliance will receive compensation.

**Scale context example:** In the case of the European Union, multiple reports (see EUROSTAT, 2022; Malik *et al.*, no date; SDSN *et al.*, 2021:42), have tracked the international negative spillovers embodied in supply chains. According to EUROSTAT (2022), EU consumption generated €1,537 billion of gross value added (GVA) in the rest of the world in 2019. Part of that consumption has generated a significant amount of negative spillovers. For example, the carbon dioxide emissions embodied in EU imports are one third higher than those produced by exports. The EU imports approximately 45% of cropland and forest products to satisfy EU consumption, which is one-third more than it exports. Seventeen percent of total EU consumption is in raw materials, which is often associated with high CO<sub>2</sub> emissions and deforestation outwith Europe (SDSN *et al.*, 2021). The main impact of the EU outwith its borders is through GHG emissions and black carbon, mostly generated for in the production of electrical and machinery products, textiles and food and beverages (SDSN *et al.*, 2021:48).

#### 6.4.3 Pollution from exported waste

Discourses are evident about the urgency towards reducing plastics, consuming less meat and transitioning to fossil fuel-free vehicle fuel. As examined by Hickel (2021), these discourses do not challenge existing ways of living in the Global North. One consequence is that environmental degradation is outsourced to the Global South where polluting factories are located, deforestation continues, and mining takes place. If current inequalities and injustices are not considered, rather than aiming to tackle environment-related issues, the proposed 'solutions' will serve as ways in which richer nations externalise problems (offshoring) and exploit other nations in the process. This risks the exploitation of workers and adherence to lower environmental standards, especially in developing countries, which may damage the local environment or pose threats to human health and social conditions (UNCTAD, 2004).

An example of externalising problems is campaigns against pollution due to plastics. While in developed countries there has been a campaign against the use of single-use plastics, and some success in increasing use of recycling processes, most of the plastic generated in the European Union is reported to be exported to developing nations (5 Gyres, no date). The technology required to burn plastics is almost always imported for use in developing nations through loans paid to the Global North. A further means by which plastics are handled in Global South countries is by their burning in open pits, with potential adverse impacts on local health and the environment (Pandey, *et al.*, 2021; Liboiron, 2018). This transforms the narrative of environmental protection into one that can allow accumulation by dispossession (Harvey, 2003) in the form of debt. It has been argued that the movement against plastics has reinforced colonialism and moves away from the principles of a well-being economy (Liboiron, 2018).

INTERPOL (2020) has identified an increasing influence of transnational organised crime to divert plastic waste towards South East Asia, and a small amount towards Eastern Europe. According to that agency, these criminal activities have been largely triggered as a consequence of China banning the import of plastic waste, which, until 2018, was responsible for 45% of the world's plastic recycling. This suggests that the success of national environmental policies in the Global North will depend on mobilising actions by other nations. However, such mobilisation should only operate within a framework which respects environmental justice in all nations.

## **7. Findings Part 2: Best practices in reducing international environmental impacts of domestic consumption and production**

### **7.1 Mapping policy levers for reducing Scotland's international footprint**

Reducing Scotland's overall international footprint of the environmental impacts of domestic consumption and production will require actions across the range of domains of food, housing, mobility, goods and services. This range of domains is reflected in the calculations of Scotland's international footprint by Global Footprint Network. A variety of policy levers are relevant to achieving this aim, all of which cannot be considered in detail in this rapid appraisal review.

Table 3 maps some of the policy options onto the consumption domains, identifying those which have the most immediate, direct links to reducing impacts on natural environments overseas. At a high level, it is not possible to identify which of the policy levers are most effective or constitute 'best practice'.

The key to evaluations of the success or failure of any particular policy intervention is how it has been implemented, the presence or absence of supporting policies as part of a package of interventions, and the supporting or constraining contextual factors at play (which varies geographically and across cultures etc.) (Southerton *et al.*, 2011). In general, there is evidence from the international literature that information and awareness-raising approaches on their own are not sufficient to change behaviours (Grilli & Curtis, 2021; Steg & Vlek, 2009).

There are numerous options of policy levers for addressing overseas environmental impacts. Bager *et al.* (2021) set out eighty-six different policy options for addressing deforestation alone. In the following sub-sections, a brief overview is provided of some of the main policy levers of relevance, rather than a comprehensive review of policy options. These are discussed under the headings of regulatory, financial, infrastructural and information-based policy levers, drawing on recommendations available in the international academic and grey literature, and examples of international best practice. The latter are set out in 'case study' boxes, coloured in blue.

**Table 3.** Overview of policy levers to reduce Scotland's international footprint  
 (Note: Bold text indicates greatest direct relevance to reducing overseas environmental impact.)

Consumption Domain	Policy Levers				
	Infrastructure	Information	Economic & Financial	Regulatory	Others (e.g. social impact)
<b>Food</b>	<ul style="list-style-type: none"> <li>• Encourage sustainable food processing and distribution</li> </ul>	<ul style="list-style-type: none"> <li>• Ecolabelling and certification of commodities</li> <li>• Promoting eating less meat through awareness raising and education</li> <li>• Promoting food waste reduction through awareness raising and education</li> <li>• Promote seasonal foods through education</li> <li>• Capacity building interventions around sustainable sourcing of commodities and circularity</li> </ul>	<ul style="list-style-type: none"> <li>• Border adjustment taxes</li> <li>• Taxes on certain commodities</li> <li>• Sustainable commodity import guarantee</li> </ul>	<ul style="list-style-type: none"> <li>• Due diligence obligations</li> <li>• International/multi-lateral agreements</li> <li>• Statutory targets (e.g. for global footprint, sustainability of imports)</li> <li>• Mandatory public procurement requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Inspecting respect of workers' human rights</li> <li>• Promoting fair payments to farmers</li> </ul>

Consumption Domain	Policy Levers				
	Infrastructure	Information	Economic & Financial	Regulatory	Others (e.g. social impact)
Housing	<ul style="list-style-type: none"> <li>Improving energy efficiency of housing stock through insulation etc.</li> <li>Supporting development of renewables infrastructure</li> <li>Supporting development of district heating networks</li> </ul>	<ul style="list-style-type: none"> <li>Energy performance certificates</li> <li>Energy monitoring and feedback</li> </ul>	<ul style="list-style-type: none"> <li>Subsidising low carbon heat technologies</li> <li>Subsidising energy efficiency improvements</li> <li>Incentivising construction material reuse and recycling through taxation</li> </ul>	<ul style="list-style-type: none"> <li>Energy efficiency standards</li> <li><b>Due diligence obligations for materials sourcing</b></li> <li>Extended producer responsibilities</li> </ul>	



Consumption Domain	Policy Levers				
	Infrastructure	Information	Economic & Financial	Regulatory	Others (e.g. social impact)
<b>Mobility</b>	<ul style="list-style-type: none"> <li>Investing in active travel infrastructure</li> <li>Investing in public transport infrastructure</li> <li>Supporting development of electric vehicles (EV) charging infrastructure</li> <li>Planning for 20-minute neighbourhoods</li> </ul>	<ul style="list-style-type: none"> <li>Skills development programmes e.g bikeability</li> <li>Engagement programmes with specific groups e.g. children and young people</li> <li>Travel planning tools and guidance</li> <li>Targeted awareness campaigns</li> </ul>	<ul style="list-style-type: none"> <li>Carbon pricing/taxation</li> <li>Congestion charging/ Low Emission Zone (LEZ)/ Ultra Low Emission Zone (ULEZ) charges</li> <li>Free or subsidised public transport</li> <li>Subsidies on Electric vehicles (EV)</li> </ul>	<ul style="list-style-type: none"> <li>Planning restrictions to direct development (densification)</li> <li>Banning petrol and diesel vehicles</li> <li>Ensuring ethical mining of lithium used on electric vehicles (EV)</li> </ul>	<ul style="list-style-type: none"> <li>Providing bikes</li> <li>Walking buses</li> </ul>

Consumption Domain	Policy Levers				
	Infrastructure	Information	Economic & Financial	Regulatory	Others (e.g. social impact)
<b>Goods and Services</b>	<ul style="list-style-type: none"> <li>• Investments in reuse infrastructure</li> <li>• Investments in recycling infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Ecolabelling and certification of imported goods/materials</b></li> <li>• <b>Capacity building interventions around sustainable sourcing of commodities and circularity</b></li> <li>• Repairability and durability labelling</li> <li>• Product passports</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Border adjustment taxes</b></li> <li>• <b>Taxes on certain commodities</b></li> <li>• <b>Sustainable commodity import guarantee</b></li> <li>• Funding innovation in circular design and business models</li> <li>• Supporting community reuse and repair initiatives</li> <li>• VAT reduction on repair services</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Due diligence obligations</b></li> <li>• <b>Mandatory public procurement requirements</b></li> <li>• <b>International/multi-lateral agreements</b></li> <li>• <b>Statutory targets</b> (e.g. for global footprint, commodity use, product reuse, material consumption)</li> <li>• Extended Producer Responsibilities</li> <li>• Enforce procurement of goods made with recycled, post-consumption materials, when possible</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Targets and monitoring</b> (imports of certain commodities, reuse, material consumption)</li> </ul>

## 7.2 Policy levers: regulatory

### 7.2.1 International/multi-lateral agreements

International agreements and commitments form an essential part of the global response to climate change and reversing biodiversity loss. National regulations on resource use can be linked directly to targets set out in such agreements, such as the IPCC Paris Agreement on climate change, and the associated Nationally Determined Contributions (NDC). Within international bodies commitments set out in international agreements can be used to frame mechanisms for strategies and roadmaps to achieve set aims, such as the National Energy Carbon Plans (NECP) of EU Member States.

At COP26 (November 2021), international agreements for reducing GHG emissions were signed. Examples are the: i) [Declaration on Forests and Land Use](#), which refers to “promoting an inclusive rural transformation”, building resilience, enhancing rural livelihoods and recognising the multiple values of forests; and, ii) [Global Methane Pledge](#) to reduce global anthropogenic methane emissions across all sectors by at least 30% below 2020 levels by 2030 including the “abatement of agricultural emissions through technology innovation as well as incentives and partnerships with farmers”.

In its portfolio of strategies to ensure compliance with these commitments, the European Union has set targets of an economy with [net-zero greenhouse gas emissions by 2050](#), and to reduce GHG emissions to at least 55% below 1990 levels by 2030 as set out in its [2030 Climate Target Plan](#) (European Commission, 2021a). These strategies are supported by legal instruments in the EU [Fit for 55](#) package such as the European Union [Climate Law](#) (European Parliament and the Council of the European Union, 2020).

The strengthening of multi-lateral commitments and partnerships to address sustainability in international trade and supply chains features in the recommendations of bodies such as the WWF and RSPB (2020), the World Economic Forum (2020), the UK Global Resource Initiative (2020), and other stakeholders (Bager *et al.*, 2021). The Dasgupta review on the Economics of Biodiversity (Dasgupta, 2021) highlights agreements in relation to deforestation, such as the New York Declaration on Forests (halving deforestation by 2020 and ending it by 2030) and the Amsterdam Declaration (aiming for deforestation-free supply chains by 2020).

More recently, in the Glasgow Leader's Declaration on Forest and Land Use (at COP26 in Glasgow, November 2021), 140 leaders committed to halting and reversing forest loss and land degradation by 2030. However, thus far, international agreements and international environmental law have been ineffective in halting global deforestation (Dasgupta, 2021; Henn, 2021). Dasgupta (2021) provides an example of deforestation in Brazil, noting that most of the countries bearing the greatest responsibility for driving deforestation there, and the resultant loss of biodiversity, are signatories to one or both of the New York or Amsterdam Declarations. Henn (2021) points to the failure of previous multilateral efforts as leading to an increased drive

for the adoption of unilateral approaches by national and supranational organisations such as the EU.

Deforestation is an example of an issue about which it is important that the Scottish Government and UK Government continue to support and drive action through multi-lateral partnerships and commitments, but where there is a growing need to address the problem through complementary unilateral action and domestic policy.

### **Case study**

#### **Major case of illegal waste exports from the United Kingdom to Poland in early 2018**

Interpol note that 'Cooperation agreements define the legal basis for working with our partners'. They describe how the provisions in each agreement are "specific to the scope of cooperation established; this can include information exchange, mutual investigative projects, database access, reciprocal representation or means of technical assistance." These types of agreements provide the basis of tackling crimes that cross borders of which environmental crime is increasingly significant.

Poland had experience in tackling waste fires, at a rate of approximately 10 every year; the occurrence of c.80 illegal fires in early 2018 represented an upward trend. The growing market of plastic waste recovery within Europe provides significant opportunities for illegal enterprises, including criminal organizations, to thrive due to the high financial value of this business sector.

A series of waste fires taking place in Poland in the first trimester of 2018 sounded the alarm regarding the illegal disposal of large quantities of imported waste, especially from the United Kingdom. An investigation by British authorities revealed that approximately 2,600 tonnes of waste were illegally sent from the United Kingdom to an illegal dump site in Poland. "This was mainly baled household waste but misdescribed as green list plastic, thus avoiding notification. The unloaded waste remained at site whilst efforts were made to repatriate and investigate but the site was subject of a significant fire in May 2018. This was one of some 80 waste fires in Poland in 2018 most of which are suspected to have been deliberate in an effort to destroy evidence." The illegal waste mostly composed of non-segregated plastics from the United Kingdom households and supermarkets. The investigation also disclosed the highly organized nature of this criminal activity, with the collaboration of members of five organised crime groups and other similar offenses involving deposit sites in Poland found in 2017 and 2018.

Open source data highlighted high criminal proceeds generated in this case, with millions of Euros paid to the owners of the illegal landfills. The owners of a landfill in Zgierz, central Poland, were allegedly paid €1.4 million to €2.8 million (\$1.55 million to \$3.1 million) to incinerate the illegally disposed waste. The

repercussions of this case had significance for public health and environmental security as waste fires are associated with the release of toxic emissions into the atmosphere. Public revenues were also affected by the costs of insuring the fire fighting service. This case raises concerns regarding the proliferation of plastic waste-related crimes in Europe as well as about the involvement of organised crime groups in such offences.

**Improving the sustainability of supply chains is essential in tackling the international impacts of domestic consumption and production on the climate and biodiversity.** Forest-risk commodities (i.e. goods and materials whose production contributes to tropical deforestation) are an example over which there are concerns with respect to adverse impacts accruing outwith Scotland.

The Global Resource Initiative (2020) note that “agricultural and forestry supply chains are at the core of the transformation required and the UK’s own import and consumption of seven key commodities – beef and leather, cocoa, palm oil, pulp and paper, rubber, soya and timber - is part of the global demand for these commodities.” The WWF and RSPB (2020) assessed the overseas land footprint required to supply the UK’s demand for seven common forest-risk commodities: cocoa; soy; palm oil; beef and leather; timber; pulp and paper; and rubber. They found that this footprint (which equates to 88% of the land area of the UK) is growing, and that 28% of the overseas land footprint falls within high or very high-risk countries (with assignment of the level of risk based upon indicators of deforestation and labour rights). It is argued that voluntary commitments to address the use of forest-risk commodities in supply chains have not resulted in progress at the scale necessary to address the problem (McCormack *et al.*, 2021; Global Canopy, 2022).

### 7.2.2 Mandatory due diligence obligations

The establishment of due diligence obligations on businesses is one of the primary policy interventions recommended in the literature. Bodies such as the UK Government’s Global Resource Initiative Taskforce (Global Resource Initiative, 2020), conservation charities (WWF & RSPB, 2020), academics and other stakeholders (Partiti, 2022; Bager *et al.*, 2021) have advocated mandatory due diligence requirements on business and financial institutions to ensure they mitigate environmental impacts through their supply chains and investments, and publicly report those actions. The Dasgupta review on the economics of biodiversity (Dasgupta, 2020) supports such actions, with an emphasis on transparency and embedding environmental considerations across the entirety of supply chains.

In light of this increasing pressure, the UK Government included provisions for due diligence obligations for forest-risk commodities within the Environment Act 2021. These provisions will aim to prevent large businesses importing illegally produced forest-risk commodities through legal restrictions, requirements to undertake due diligence exercises on their supply chains,

and mandatory annual reporting. A [consultation on the implementation of the provisions](#), which will require to be enacted through secondary legislation, was completed in March 2022 (DEFRA, 2022). As this is a new policy approach, in the UK and the EU, there is a lack of existing international evidence of best practice on which to draw. Research commissioned by WWF identified several critical factors that will determine the effectiveness of UK due diligence obligations (McCormack *et al.*, 2021). These include:

- The thresholds at which businesses are included in the scope of the legislation (which the report proposed should be based on turnover and the volume of forest-risk commodities);
- The scope of forest risk commodities included (arguing for the inclusion of beef and leather, cocoa, coffee, rubber, maize, palm oil and soy, and all products in which these are used), and the breadth of commodities to be prioritised. [Note: This is particularly important if the UK Government proposal for a phased approach is implemented, UK Government, 2021]<sup>2</sup>
- Enforcement of the obligations, including the powers and competency of the authority responsible for enforcement, the scale of the fines, and the sanctions they can apply.

The UK due diligence obligations have been criticised for including only deforestation and land conversion that is illegal according to the local laws of the producer country. It is argued that this leaves a large proportion of deforestation in the tropics outwith the scope of the legislation, and provides a perverse incentive to producer countries to scale back protections for forest ecosystems (Jennings *et al.*, 2021; dos Reis *et al.*, 2021). In comparison, proposals by the EU adopt a broader approach, stating that products may only be placed on, or exported from, the European market if they are 'deforestation-free' (i.e. not produced as a result of deforestation) and have been produced according to the laws of the producer country (European Commission, 2021b). WWF's research (McCormack *et al.*, 2021) urges businesses to address all aspects of deforestation and land conversion, noting that such an approach may be less complex to implement.

Robust certification schemes (see '[Certification and ecolabelling](#)' section) could help support businesses to undertake due diligence. However, overreliance on certification in the full tracing of supply chains has risks due to the limitations of existing certification schemes (Wood *et al.*, 2021), and barriers to full traceability. In both cases, improvements in data and data systems are needed (Wood *et al.*, 2021).

Further considerations on the future implementation of due diligence obligations include compliance with World Trade Organization (WTO) rules,

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<sup>2</sup> In comparison, EU due diligence proposals committed to covering cattle, cocoa, coffee, palm oil, soya and wood (including all products derived from or fed using these commodities) and cover all businesses making these commodities or products available on or exporting from the EU market, with reduced obligations for small- and medium- sized enterprises (European Commission, 2021).

and whether producer countries might claim that such regulation constitutes an unfair obstacle to trade (Henn, 2021; Sarmiento & Oeschger, 2022). There are also concerns about the potential burden placed on producers that could result from a proliferation of regional and domestic deforestation legislation, with varying definitions of deforestation and requirements for reporting, and the risk of requirements being shifted on to farmers rather than equally distributed across value chains (Sarmiento & Oeschger, 2022). Authors have called for more meaningful involvement of stakeholders from the Global South in the politics of due diligence to increase the legitimacy of such demand-side regulatory actions by administrations in the Global North (Schilling-Vacaflor & Lenschow, 2021).

In the UK, the implementation of due diligence obligations falls within the reserved powers of the UK Government. However, the Scottish Government could seek to influence the development of due diligence regulations, or future reviews of regulations, with a view to increasing alignment of the UK approach to that of the EU. It could seek opportunities to move beyond a legally-based approach to defining forest-risk commodities, and ensure that requirements apply to the range of businesses which place goods and products using forest-risk commodities on the Scottish and UK markets.

### 7.2.3 Statutory targets and monitoring frameworks

Statutory targets and monitoring frameworks are means of pushing and measuring actions on international environmental impacts of domestic production and consumption in the UK. For example, the Global Resource Initiative (2020:22) called for the UK (central government and the devolved administrations) to adopt a legally binding target to halve the UK's global footprint by 2030, proposing a sub-target of ending deforestation from UK commodity supply chains by no later than 2023. They argue that this "would provide the necessary signal for a shift in behaviour, acting as a legislative 'cliff edge' to propel business, finance and government to make the necessary changes to purchasing and investment strategies within their organisations to a clear future deadline" (Global Resource Initiative, 2020: 22). As well as overarching targets and indicators, WWF and RSPB (2020) also support the adoption of commodity-specific targets for e.g. soy, cocoa, timber, and pulp and paper, as well as continued implementation of the national statement on palm oil.

Amongst the devolved administrations Wales has, amongst its national wellbeing indicators, an established global footprint indicator, of which a case study box follows.

#### **Case study**

##### **Welsh global footprint national indicator**

The [Wellbeing of Future Generations \(Wales\) Act 2015](#) sets out a broad range of goals for social, economic and environmental sustainability to support wellbeing, with a set of [national wellbeing indicators](#) put in place to monitor



progress. One of these goals is for a 'globally responsible Wales', which includes a milestone target for Wales to 'use only its fair share of the world's resources by 2050'. Progress towards this milestone is monitored by a global footprint indicator representing the ecological footprint of the country in Mgha (million global hectares).

#### 7.2.4 Mandatory public procurement requirements

A domestic regulatory policy lever commonly recommended as an intervention in various topics relates to the use of environmental criteria in public procurement decisions (Bager *et al.*, 2021; World Economic Forum, 2020). More sustainable (green) public procurement has the potential to contribute towards reducing environmental footprints in several ways. Firstly, changes in public procurement can directly impact on overall consumption because of the large volumes of food, goods and services that are purchased by public sector organisations (including public agency offices, hospitals, schools and prisons). Secondly, it is argued that, through green public procurement, public bodies can lead by example, provide price stability, and help expand markets and leverage finance for more sustainable products (Lundberg *et al.*, 2016; Pouikli, 2021).

Green public procurement features strongly in EU Green Deal policies as a route to securing environmental objectives in relation to supply chains and the circular economy transition (Pouikli, 2021). Legal frameworks for achieving socially responsible public procurement are reflected in EU Directives (European Commission, 2021c). However, the effectiveness of public procurement measures relies in part on robust and transparent systems for mandatory reporting and monitoring of compliance (WWF & RSPB, 2020).

Although green public procurement is currently receiving attention as an environmental policy instrument, some authors warn of its complexity and the difficulty of predicting its impacts on the environmental objectives it seeks to support (Lundberg *et al.*, 2016).

Despite these caveats, green public procurement represents a policy instrument with potential to influence supply chains that sit outwith the domain of international trade (an issue reserved to the UK Government). It can be used to overcome barriers to uptake of some practices, including influencing food services, which can form part of a balanced approach to encouraging the uptake of local produce, including those linked to dietary change (Schwarz *et al.*, 2022). It can also contribute to the provision of stable markets and demonstrate leadership. One example is the 'Fair trade food for Munich's schools (Germany)' identified in the EU guide to taking account of social considerations in public procurement (European Commission, 2021c). In this example, 5% of the award criteria for a contract to provide meals to 490,000 school children had to be reserved for social and environmental aspects, such as raw materials certified through Fairtrade International, the World Fairtrade Organisation, or equivalent.



Exploring such considerations in public procurement is an area within which there is significant scope for The Scottish Government to act. This would be consistent with UN Sustainable Development Goal 12 ('Ensure sustainable consumption and production patterns') which calls on governments to promote the use of public procurement practices to further the sustainable development agenda (Target 12.7).

### 7.3 Policy levers: economic

#### 7.3.1 Taxation

Dasgupta (2021) makes a case for the use of taxation to correct (to an extent) for externalities, such as environmental degradation, which would not otherwise be reflected in market prices. **The intention is to create a more level playing field in which goods and services produced to lower environmental or social standards do not have an undue price advantage over more sustainable goods and services.** *Border adjustment taxes* are an example of this type of policy lever. These are imposed based on where goods and services are consumed, resulting in higher tariffs on imports that do not conform to the emissions standards of the country in which they are consumed. However, Dasgupta (2021) points out there are limitations to this approach, the effectiveness of which depends on it being widely applied and well designed.

**EU Carbon Border Adjustment Mechanism (CBAM):** The CBAM was recently approved (13 December 2022), by the European Parliament as a tool designed to set prices to carbon emissions generated during the production of goods imported into the EU. This mechanism is intended to phase out the current EU Emissions Trading System (ETS) which provided the allocation of free allowances. The prices will be set through weekly updated ETS allowances and the final cost to be paid within the EU will consider if the importer has already paid any similar carbon tax elsewhere to avoid double taxation. The initial phase is expected to enter into force on 1<sup>st</sup> October 2023 and, initially, will only cover selected carbon intensive industries (cement, iron and steel, aluminium, fertilisers, electricity and hydrogen) (European Commission 2021b).

*Carbon taxes* have also been widely advocated as a way to incorporate environmental costs into market prices (Stiglitz *et al.*, 2017; World Economic Forum, 2020; Mildemberger *et al.*, 2022). Such taxes have been implemented in many countries, including Finland, the Netherlands, Sweden (see case study box), Norway, Switzerland and Canada. One of the barriers to adoption of carbon taxes has, been public acceptance, with concerns expressed about the regressive nature of such taxes that impose a disproportionate burden on the less well off (Mildemberger *et al.*, 2022; Prasad, 2022). Decisions over how carbon tax revenues are directed (whether through e.g. public spending, tax cuts) may influence public attitudes, however recent research indicates that channelling revenues back to citizens via rebates or 'dividends' is not automatically associated with

greater acceptance (Mildenberger *et al.*, 2022). Other central considerations in the implementation of carbon taxes include the rates of taxation applied and the existence of exemptions (particularly regarding high-emitting sectors holding political influence). The carbon price necessary to support the achievement of the Paris Agreement climate targets has been estimated at US \$50-100 per ton of CO<sub>2</sub> by 2030 (Stiglitz *et al.*, 2017).

## Case study

### Policy lessons from Sweden's carbon tax

When seeking to reduce emissions, the use of a carbon tax can cut across sectors such as food, housing, mobility, goods and services. However, such a tax can apply a strain on an economy and cause carbon leakage.

Sweden introduced a carbon tax in 1991 during the 'Tax reform of the century' (Agell *et al.*, 1996) in exchange for reductions in energy and labour taxes,<sup>3</sup> starting small, and growing over time. Several principles informed the tax's design: revenue neutrality, no earmarking, incrementalism, polluter pays, carbon leakage, and a double dividend of gains in environmental terms and in economic efficiency (Ewald *et al.*, 2020). These guided how different sectors would be targeted with the tax and how to guard against carbon leakage while maintaining revenue neutrality, and so not increasing the total of taxes collected by government.<sup>4</sup>

It is now one of the highest tax rates on carbon in the world: US\$130/tCO<sub>2</sub>e (World Bank, 2023). The strategy behind the tax primarily targeted fossil fuels, excluding biomass, waste products, and some energy-intensive industries. Although it is difficult to isolate the effects of the tax, scholars argue that there has been a notable impact on Sweden's emissions, specifically in district heating, leading to a 'fuel switch' to biomass.

The decoupling of CO<sub>2</sub> from Gross Domestic Product (GDP) has exaggerated the estimates of reductions in emissions as it does not account for carbon leakage and CO<sub>2</sub> embedded in imports. In coming years, Sweden's highest emitting sectors (i.e. industry and transportation) will be a challenge to achieving its goals of net zero GHG emissions.

Earmarking refers to dedicating certain revenues for a specific purpose. Although Swedish policy has been for no-earmarking, elements of the national budget are customarily used for sustainability type projects such as improved public transport and the promotion of biofuels (Åkerfeldt & Hammar, 2015). Incrementalism of the tax was set out in its aim to 'start small but keep growing' with a final goal of a high tax across all sectors.<sup>5</sup>

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<sup>3</sup> The terms CO<sub>2</sub> and *carbon* are used synonymously.

<sup>4</sup> Another subtle concern is government legitimacy. For instance, to what degree are policymakers willing to risk stakeholder confidence and popular support (Jagers and Hammar, 2009).

<sup>5</sup> Though the CO<sub>2</sub> tax has been Sweden's instrument of choice, they have used other emissions instruments like stringent building regulations and green car rebates (SEPA, 2017). Additionally, Åkerfeldt

The polluter pays principle informed the tax through analyses of true costs, which can be social or environmental costs. Although these are difficult to determine, they informed the design of the tax (Vaughan & Ardila, 1993; Young & Stokke, 2020).

Carbon leakage refers to when a company tries to avoid a CO<sub>2</sub> tax by moving some production or its purchases to a location with less stringent laws. Leakage is such a common issue (Ferguson & Sanctuary, 2014; Næss-Schmidt *et al.*, 2012) that the European Commission (2011) published a guidance document to help address its avoidance. Sweden's aim to avoid leakage led to protections for critical industries: those vulnerable to market risk by either product type (such as agriculture or forestry) or energy intensity (such as electricity or steel production). As Sweden participates in the EU ETS (Europe's Emissions Trading System) it also sought to protect its industries from double taxation.

Although a controversial concept (Bohm, 1997; Goulder, 1995; Oates, 1995), double dividend argues that if taxes are 'a necessary evil' then governments should be able to raise revenues while also protecting the environment.

With this general principle and the adjustments and protections for some Swedish industries, there has been cross-partisan agreement on the tax since 1991 even when political power shifted.

All of these factors influenced the design of Sweden's carbon tax levels: one for generalized fossil fuel use and another for more energy-intensive industries. However, in Sweden's case, the approach has been that polluters should pay, but not too much, recognizing that requiring polluters to pay for the full costs of their activities is an ideal that has yet to be economically and environmentally realized.

**Key historical moments.** In 1991, the key changes in Swedish tax law were: i) both of the marginal income tax and energy tax rates were cut by 50%; ii) the new CO<sub>2</sub> tax had two main levels of a general and a lower level for critical industries; iii) the tax would increase over time; iv) other compensatory items such as a reduced labour tax, a sulfur and nitrous oxide tax, a Value Added Tax (VAT) on energy, state aid for fossil-free electricity production, and various tax shelters were eliminated (Åkerfeldt, 2011; Scharin & Wallström, 2018).

From 2000 to 2004, in a 'green tax reform', Sweden tightened polluter taxation with CO<sub>2</sub>, energy, diesel, and electricity taxes increasing while social benefits such as wage deductions were expanded, employee contributions to social security reduced, and a 'green adult education initiative' introduced to reskill displaced workers (Hoerner & Bosquet, 2001). In 2018, Sweden achieved its goal of a unified general tax in which the industry and general CO<sub>2</sub> tax levels equalized. However, some fossil fuels for non-heating

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and Hammar (2015) assert that when trying to shift stakeholders away from fossil fuels, it is important to have other options readily available.

purposes were still exempt and a CO<sub>2</sub> tax for Swedish cogeneration plants within the EU ETS remained (Scharin & Wallström, 2018).

**Some evidence and effects.** Although direct causes are difficult to identify, scholars argue that the tax has had a beneficial effect. Sweden's claim has been that during the process of decoupling CO<sub>2</sub> from GDP, its economy has grown and emissions declined (Åkerfeldt, 2017, p. 15). However, this claim is from a production rather than a consumption perspective of emissions, overlooking carbon leakage. A consumptive view of CO<sub>2</sub> embedded in Sweden's imports finds that Sweden's CO<sub>2</sub> reductions are partly due to domestic transportation (Jiborn *et al.*, 2018). Another study finds that Sweden's 2008 emissions were 17% higher than reported.

**District heating.** Arguably the most successful effect of the tax is the 'fuel switch' in the district heating sector. As district heating has significant efficiencies at scale, reductions in this area can be notable (Persson & Werner, 2011). Since the 1990s, biomass and waste incineration have almost replaced the use of fossil fuels in Sweden's district heating (Ericsson & Werner, 2016). Most dramatic is the change in residential heating (Scharin & Wallström, 2018, p. 20), of which, in 2015, district heat supplied 92% of Swedish apartments (2015).

**Industrial sector emissions.** Analyses of the industrial sector (Ackva & Hoppe, 2018, p. 3) record growth in less energy-intensive industries and a decrease in combustion emissions. However, it is not clear how the tax influenced these changes (Ackva & Hoppe, 2018). Iron and steel production dominates Sweden's industrial emissions (SEA, 2018), which increased by 10% between 1990 and 2014 (Ackva & Hoppe, 2018). Scholars argue that between 1991 to 2004 the different elements affecting emissions in the industrial sector are an effect of the tax (Brannlund *et al.*, 2014; Pardo Martínez & Silveira, 2013). Over several decades, there has been an increase in the proportion of electricity and biomass in the composition of energy in the industrial sector, and an overall decline in fossil fuel use.

**Transportation.** Although most of the transportation sector (road, rail, aviation, and shipping) has been levied the full tax (Scharin & Wallström, 2018), it has been difficult to decarbonize. In 2018, domestic transport accounted for about a quarter of Sweden's total energy use (SEA, 2018) and about a third of its GHG emissions (Scharin & Wallström, 2018). It took nearly 20 years before a decline in emissions from transportation was observed (Scharin & Wallström, 2018, p. 20). However, the tax was incremental, and the Swedish population increased over that time period. Andersson (2017) argues that between 2000 and 2005, emissions from transport fell by about 12.5% and that three-quarters of this reduction (9.4%) was due to the tax. Motor fuels remain a challenge for Sweden (Åkerfeldt & Hammar, 2015), about which there are continuing efforts to promote public transport, more active travel, zero-emission vehicles, solar cell and energy storage technologies.

**Total energy supply.** Since the 1970s, Sweden's nuclear and biomass production has grown accompanied by a decline in fossil fuels (which more

than halved between 1970 to 2015). By 2015 the growth in nuclear power had stabilized, but by then Sweden was already no longer primarily dependant on fossil fuels. Although hard to link cause and effect with accuracy, these shifts are consistent with the expectations of the tax.

**Summary.** Lessons from Sweden's carbon tax should consider Sweden's history and socio-political dynamics, such as its strong welfare state and low levels of socio-economic inequality. Such dynamics can be seen as the ground upon which a carbon tax operates and may, for example, ameliorate regressive elements of the tax. Although this tax has had successes, it has taken several decades for them to be achieved, and other countries may need to take, if politically feasible, a more aggressive approach. Although Sweden has experienced some decoupling, it has also experienced carbon leakage and will be challenged to meet its goals of net zero, especially in its industrial and transportation sectors.

**Commodity taxes** can be applied to specific commodities associated with environmental impacts outwith Scotland. Such taxes apply to all relevant products, whether produced domestically or overseas, and whether or not they comply with sustainability criteria. There has been considerable interest in the use of commodity taxes in public health promotion (e.g. on sugar-sweetened beverages, fast food) (Powell *et al.*, 2013; Wright *et al.*, 2017). With respect to reducing global environmental footprints, the potential for taxing meat products in particular has been an issue of interest and debate. Reducing the consumption of meat, particularly red meat, in high income countries has an important role to play in achieving a more sustainable environmental footprint (Dasgupta, 2021; Akenji *et al.*, 2021). Evidence suggests there is a need to tackle the upwards trend globally in the land required for meat production (Machovina *et al.*, 2015).

*Meat taxes*, such as levying higher rates of VAT on more emission-intensive meat products, could be used to influence consumer demand for meat. This approach has been discussed in several countries but not yet implemented in any<sup>6</sup> (Kwasny *et al.*, 2022; Caro *et al.*, 2017; Pinto, 2021). One of the main challenges to such a tax relates to the potential level of public unacceptability of such a measure, with a reluctance of politicians and NGOs to advocate for demand-side interventions on the politically contentious issue of meat consumption (Laestadius *et al.*, 2014). Government intervention in dietary choice (from a classical liberalist point of view), such as through a meat tax, poses 'unique complexities' over other commodity taxes because of ingrained cultural meanings around meat consumption and production, and differing values around animal welfare, environmental issues and freedom of choice (Simmonds & Vallgård, 2021). As with other environmental taxes, concerns have been raised about regressive effects on

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<sup>6</sup> The closest to a meat tax that appears to have been implemented was a tax on foods high in saturated fat imposed in Denmark in 2011, which was removed after only a year due to pressure from industry and concerns about impacts to the domestic market from people buying products abroad (Pinto, 2021).



lower income groups, although these could be mitigated through redistribution of tax revenues (Säll, 2018; Pinto, 2021).

### 7.3.2 Sustainable commodity import guarantees

Recommendations in the literature around financial policy levers include encouraging more sustainable supply chains through the uses of taxes and incentives. Amongst the recommendations of the [UK Global Resource Initiative \(2020\)](#) is the adoption of sustainable commodity import guarantees.

**Sustainable commodity import guarantees, such as border adjustment taxes, aim to address price differences between sustainable and unsustainable products. However, instead of disincentivising unsustainable options they aim to incentivise more sustainable imports.** Therefore, they seek to “incentivise sustainable agricultural and forestry commodity imports over conventionally sourced commodities” (Global Resource Initiative, 2020). Such guarantees act to reduce the financial risks associated with trade finance for sustainable imports, resulting in cheaper (and greater value of) finance being available to importers of sustainable products, incentivising banks to support smaller or ‘less well rated’ companies.

The operation of sustainable commodity import guarantees would require agreement on qualifying criteria. The Global Resource Initiative note that these could build on “existing sustainability certification regimes and best practices for demonstrating sustainable commodity sourcing (avoiding deforestation and land conversion).” They also identify qualifying criteria as including: i) verifiably sustainable commodities; ii) commodities that the UK does not already produce and about which there is encouragement to switch from those from conventional to sustainable sources. One aspect of these guarantees is that they should be cost neutral to governments and not require direct subsidies, as per the [UK Export Finance guarantees](#).

Sustainable commodity import guarantees is an example of the new forms of green finance which are of interest for policymakers and academics (Akomea-Frimpong *et al.*, 2021; Debrah *et al.*, 2022).

## 7.4 Policy levers: Infrastructure-based

### 7.4.1 Decommissioning infrastructure of energy assets

Following the expansion of oil and gas production from the UK Continental Shelf since the 1970s (Scottish Enterprise, 2016) the lifecycle of oil rigs, vessels and other fossil fuel-related assets is moving towards programmes of decommissioning. There is a legal obligation to decommission structures in a way that protects the environment. This is also true of renewable energy structures, such as wind turbines. Given that wind turbines have a life expectancy of between 20 and 25 years (Adedipe & Shafiee, 2021), it is expected that by 2030 over 1,900 such structures will need to be decommissioned (Wood 2021). The decommissioning of existing fossil fuel energy assets represents an opportunity, already being pursued in Scotland,

of reducing the consumption of raw materials needed for the construction of renewable energy assets, and wind turbines in particular.

## Case Study

### Ardersier Port Transformation (Ardersier Port Authority, 2021)

Ardersier, Scotland's largest brownfield port, was bought in 2021 to be transformed into Europe's first circular Energy Transition Facility. Through a circular economy approach, the goal is to decommission existing fossil-fuelled energy assets (i.e. oil rigs and vessels) to support the construction of wind turbines for an expanding, dispersed, network of renewable energy infrastructure (see Figure 6). The initial investment plan includes a £20 million capital dredging programme which will re-open the port.

Through to 2026, the plan is to provide:

- An oil rig decommissioning facility;
- A £300 million green steel plant;
- A concrete production facility using the sand dredged from the seafloor within the port, and by products from the steel plant and waste facility;
- A floating hub for manufacturing concrete floating wind foundations.

The objective of the project is to develop the largest wind foundation fabrication, manufacturing and assembly facility in the UK. To date, the project has reached agreement to provide exclusive access to BW Ideol for the manufacture of floating wind foundations.



**Figure 6.** Ardersier Port Project (Source: BW Ideol <https://bw-ideol.com/en/work-starts-ardersier-port-transformation>)



The Ardersier project is not the only one in Scotland with similar objectives. The Decommissioning project for Lerwick aims to recycle over 11,500 tonnes of subsea equipment from BP's Schiehallion and Loyal oil fields west of the Shetland Islands.

These projects represent an opportunity for Scotland to reduce its consumption of raw materials needed for the construction of wind turbines, in particular of steel components. It should reduce the impact of the use of steel in Scotland; increase its capacity to produce renewable energy, and support the reduction of waste produced by the decommissioning of oil rigs.

#### 7.4.2 Reuse through circular economy

A route to reducing international impacts associated with imported materials, goods and services is increasing circularity in Scotland's consumption and production activities. This means moving from a 'take, make and dispose' linear economic model, to a circular economy, in which resource inputs and waste outputs are reduced by keeping materials circulating in the system.

Scotland's commitment to transitioning to a circular economy is set out in Scotland's circular economy strategy. The greatest positive environmental impacts from becoming more circular can be achieved through focusing action towards activities that create short loops in the system and which sit at the top of the waste hierarchy, namely reducing consumption and increasing reuse and repair of items (Reike *et al.*, 2018; Kirchherr *et al.*, 2017). Whilst the provision of recycling infrastructure is a well-established element of waste policy in many countries, far less policy focus has been directed towards reuse infrastructure.

Some countries and regions are taking more ambitious approaches to reuse. These include the establishment of statutory reuse centres (see case study of Greece below), and the central establishment of networks of formally recognised and accredited reuse centres delivered through social enterprises (see example of Flanders' reuse network below).

#### Case study

##### **[Statutory reuse centres in Greek municipalities](#)<sup>7</sup> (European Environment Agency, 2022)**

Greece's Waste Framework Law (4819/2021) has committed to the establishment of mandatory reuse centres by 2024. Municipalities with more than 20,000 residents, along with regional waste management bodies in collaboration with the smaller municipalities, will be required to set up reuse centres to collect used items including furniture, waste electrical and electronic equipment, bicycles, toys etc.

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<sup>7</sup> These case studies are drawn from the recent draft report *Review of selected 'problem products' in the circular economy* by Hague *et al.* (2023), in the Scottish Government Strategic Research Programme (project JHI-C4-1).

## Case study

### Flemish Reuse Network (Delanoetje & Bachus, 2020)

The Belgian federal region of Flanders has a reuse network comprising a network of accredited reuse centres which operate as non-profit social enterprises, together with private sector second-hand shops. The reuse centres provide points for the collection of used items and purchase of second-hand items, alongside offering free collections of donations from homes. The network of reuse centres was established in 1994 by the Flemish waste agency with the aim of creating social benefits through the employment of individuals experiencing significant barriers to employment, such as those in vulnerable groups and those in long-term unemployment.

In 2018, the whole network consisted of 145 outlets, which provided employment to more than 10,000 employees. More than 5,000 of those were employed by the non-profit social enterprise reuse centres. The network of accredited reuse centres is subsidised by the Flemish Government, with approximately 40% of their revenue from subsidies with most of the remaining 60% generated from their own activities. Their activities are also supported by a lower rate of VAT for accredited reuse centres (6% instead of 21%). The reuse network has a formally recognised role in the delivery of Flemish waste policy, and is central to the delivery of Flanders' reuse targets.

Reuse infrastructure includes facilities for the deposit of items and the purchase of used goods. Developing the market for reused items requires innovation in the retail of second-hand goods, including attention to the shopping experience and tailoring to different market segments. Supporting the clustering of reuse outlets offers potential (e.g. see case study: circular shopping centres), which can also be a focus for social innovation (e.g. see case study: social innovation recycling). Reuse infrastructure can also include online shopping options (e.g. online shops operated by reuse centres).

The EU Strategy for Sustainable and Circular Textiles (European Commission, 2022) sets out to ensure that by 2030 textile products placed on the EU market are long-lived and recyclable, to a great extent made of recycled fibres. It is linked to the EU Sustainable Products [Regulation](#). At present textile value chains are recognised as being long, globalised and diverse, with less than 1% of textiles recycled into new textiles. The Strategy recognises that “most of the pressure and impact linked to clothing, footwear and household textiles in Europe occur in other regions of the world, where the majority of production takes place.” It notes that “the presence of substances of concern hampers future high quality recycling and pollutes water and soil, and textile waste collection rates and recycling capacities are low to medium in the EU.”

The EU Strategy also proposes a framework to create conditions and incentives to boost competitiveness, sustainability and resilience of the EU textile sector, including addressing its environmental and social impacts. Its proposals include setting targets to significantly increase reuse and recycling

efforts as well as green public procurement in the EU, support and encourage sustainable production, sustainable lifestyles, tackle the presence of substances of concern, improve textile waste collection and recycling in the Member States, and building human capacity with new skills.

## Case Study

### Circular shopping centres (European Commission, 2019)

The EU Circular Economy Stakeholder platform highlights a number of examples of best practice which focus on large scale retail of second-hand items or clustering of smaller outlets specialising in reused, refurbished and recycled items within dedicated shopping villages or centres. The business models underpinning these ventures vary, such as the private sector led [Yuman Village in Brussels](#), and the local government operated [48er-Tandler reuse centre in Vienna](#), ReTuna Återbruksgalleria (promoted as the 'world's first recycling mall') in Eskilstuna, Sweden.

Common elements of these initiatives include the incorporation of central collection points for the centres, offering one-stop-shops for retail needs across a range of product types, attention to customer experience and attractive visual merchandising of reused items.

## 7.5 Policy Levers: information-based

### 7.5.1 Certifications and ecolabelling

The first eco-label is credited as being the [Blue Angel](#), Launched by the West German government in 1978, which is described as a market-based, voluntary tool of environmental policy ([Blue Angel, 2023](#)). Their use has expanded with many national and international labels emerging. These labels can be categorised into two general areas depending on their origins. One set are developed and accredited by governments or regions (e.g. EU eco-label or Nordic Swan), and others are by private or NGO sectors (e.g. Fair Trade, Rain Forest Alliance, Forest Stewardship Council, Bioland). In recent years, the [Fairtrade](#) ecolabel has started to expand towards the inclusion of labour rights (fair wages, unionization), protection of the environment, gender equality and ensuring access to international markets by farmers.

Both sets of certifications tend to be voluntary, but those relating to organic status are covered by legislation and strict requirements<sup>8</sup>.

The [Ecolabel Index](#) identifies at least 456 ecolabels from 199 countries across 25 sectors. While most ecolabels are designed to appeal to the consumer in relation to their environmental impact (Grankvist & Biel, 2007), some are also focused on the social aspects underlying the production of products. For example, the *Fairtrade* label was originally designed to support local coffee

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<sup>8</sup> For further information see European Commission information on organic status at [https://agriculture.ec.europa.eu/farming/organic-farming/legislation\\_en](https://agriculture.ec.europa.eu/farming/organic-farming/legislation_en); European Commission, 2018.

producers from Mexico to access international markets as a way of improving their living conditions (Redfern & Snedker, 2002). The purpose was not to improve the environmental impacts of coffee production, instead it was about promoting greater economic return for a commodity.

Ecolabels have been criticized, mainly in relation to the possibility of their use for corporate marketing and greenwashing (De Chiara, 2016) and a lack of regulation regarding the setting of standards (see Nehf, 2018). Typically, ecolabelling requires some form of supporting evidence or information. Tools for the assessment of environmental and social impacts of products and processes are widely used. Their origins and mode of operation vary. One example of the use of tools for assessing environmental, economic and social sustainability of farms was undertaken by the [EU H2020 UNISECO project](#) on sustainable transitions to agroecology. These tools included the [Cool Farm Tool](#) (a GHG inventory, water footprint and biodiversity assessment tool), and the [SMART Farm Tool](#) (Sustainability Monitoring and Assessment RouTine), a multidimensional sustainability assessment tool). Each tool is used to provide quantitative assessments of the impacts of the farm practices and systems, either at farm or business levels.

The Cool Farm Tool is used to assess on-farm characteristics such as biodiversity, water use and GHG emissions, and environmental impacts of land management practices. It comprises a generic set of empirical models of Tier 1, Tier 2, and simple Tier 3 approaches to estimate full farm-gate product emissions (IPCC, 1997), and a biodiversity module based on the Gaia biodiversity yardstick (CLM, 2019). It is one element of the Cool Farm Alliance, membership of which includes numerous agri-food businesses, including those which are multi-national in operation and which use the Tool as part of the assessments of the environmental footprint of products they produce or handle.

The SMART Tool is based on the guidelines for the Sustainability Assessment of Food and Agriculture Systems (SAFA) from the FAO and covers a wide range of topics with over 300 indicators. These include environmental integrity, economic resilience, social well-being and good governance (Landert *et al.*, 2019). It enables account to be taken of environmental impacts of sourcing materials (e.g. origin of mined fertiliser, fuel, employment rights, child labour, land tenure). Reporting on the application of the SMART Tool, Curran *et al.* (2020) notes the insights such a tool provides to the strengths and weaknesses of the contributions of the Swiss organic sector to sustainability compared to the most relevant official statistics.

Landert *et al.* (2020) report on the application of these tools in 13 countries across Europe. They found that, in the long-term, agro-ecological farming systems and practices are characterised by higher assessments of sustainability, including higher profitability due to premia paid by consumers and shorter supply chains, supporting findings of other studies (e.g. Hatt *et al.*, 2016). From the same study, Albanito *et al.* (2021) note the types of topics for which the quality of background information is weak (e.g. characteristics of

inputs with international footprints). From the project findings, Schwarz *et al.* (2022) found that farmers are willing to transition towards agroecology but not to operate under the limitations of organic certification. Thus, much of the aims of the EU Farm to Fork Strategy (European Commission, 2020b) are achieved in a more flexible and contextually sensitive way than certification would permit (Miller *et al.*, 2022).

Miller *et al.* (2022) also observe that “Overall, many of the social and environmental benefits can be realised if agricultural systems adopt wide-ranging innovations, from the plot to the food systems level. However, the total size of domestic food systems is central to avoid a shift of environmental pressure to regions beyond the EU.” Tools such as SMART can contribute to assessing and monitoring agricultural systems, and can be used to provide evidence in support of Sustainability label that takes account of environmental, economic and social factors.

Miller *et al.* (2021) provide findings of an analysis of the application of the Cool Farm Tool and SMART to a farm system and lowland farm in eastern Scotland, in storymap format. They show the relative level of performance of a study farm according to criteria of social-wellbeing, good governance environmental integrity and economic resilience. These take account of environmental factors (e.g. materials and energy) and social conditions (e.g. fair trading practices, equity, labour rights) of internationally sourced inputs. The illustration shows how use of the modelling tools enable scenarios of alternative practices to be evaluated with respect to the overall level of sustainability of individual farms, as summarised by Albanito *et al.* (2021).

Research in Spain and Scotland ([Akaichi \*et al.\*, 2020](#)) reports on the preferences and willingness of consumers to pay for nutrition labels, and effects of labels such as organic, local and low GHG emissions. Results showed a willingness to pay premiums for certain combinations of food attributes and labels, and in the UK demand for beef mince with low fat content can be increased if also labelled as organic or low in GHG emissions.

As part of its Circular Economy Framework, the EU is updating the EU Ecolabel, a voluntary label for products that fulfil a minimum set of standards. This update also has an objective of promoting sustainable production and consumption, by providing consumers with alternatives to conventional products that are more friendly to the environment (European Commission, 2019b). While ecolabels seek to empower consumers in making environmentally conscious decisions, they appear to be limited in providing information about the labour and social conditions under which products were produced. Where such schemes are voluntary they also lack credible enforcement procedures.

## Case Study

### Nordic Swan Ecolabel

The Nordic Swan Ecolabel, established in 1989, helps consumers, companies and other organisations to purchase in an environmentally conscious manner. It encourages the development of products and services that have less of an impact on the environment and climate than similar products on the market.

The Nordic Swan Ecolabel takes into account the environmental impact of goods and services during their entire life cycle, from raw materials to waste products. It places strict requirements on climate and environmental impact, and function and quality. The label serves as a consumer-policy tool for the environment and complements other environment-policy instruments. It is an instrument for achieving the goals of the Nordic countries for sustainable consumption and production, as outlined in the [Nordic Council of Ministers Action Plan for Vision 2030](#), and the [Nordic Plan for Sustainable Development 2021-24](#).

While the Nordic Swan Ecolabel focuses on the lifecycle of goods, just as in most ecolabels, it takes no account of the social and economic conditions under which they were produced. Therefore, it is not possible to consider sustainable production or consumption.

The promotion of ecolabels provides valuable insights, but not always clear evidence of guarantees, over the approach taken. They appear to have limited accountability, except where they may conflict with regulations over advertising and marketing, e.g. see UK Government guidance at <https://www.gov.uk/marketing-advertising-law>. Although many ecolabels seem to fall short in providing a comprehensive analysis of the entire supply chain in which environmental impacts, workers, and goods are scrutinised, there has been a change towards a wider range of factors taken into account as in the case of *Fairtrade*. The Scottish Government should ensure a basic level of accountability against which ecolabels should be assessed.

#### 7.5.2 Capacity building

The OECD (2012) note that “strengthened capacity for environmental management will empower individuals, organisations and society as a whole, and it can create a more transparent governance of environmental and natural resources.” One context for such strengthened capacity is the potential for exports into markets in which consumers are becoming more conscious of the roles of supply chains that source products from sustainable systems, and knowledge of the resources and systems behind what is being imported and used in products.

They propose a framework for developing capacity and note that capacity needs to be built at the levels of the individual, organisation, and the enabling policy environment. The enabling policy environment should



consider the “policy, legal, regulatory, economic and social support systems in which individuals and organisations operate. It is determined by policies, rule of law, accountability, transparency and flow of information.” Table 4 provides an overview of the framework.

**Table 4.** OECD framework for enhancing capacity with respect to greening development (Source: OECD, 2012).

<b>Enabling environment</b>	<b>Does the development support provider:</b>
<b>Environmental policy framework</b>	<ul style="list-style-type: none"> <li>■ Have a policy on support to the environment?</li> <li>■ Have a policy on integrating environmental considerations into country programming?</li> <li>■ Have a policy consistent with other multilateral and bilateral development organisations?</li> </ul>
<b>Environment programme commitment</b>	<ul style="list-style-type: none"> <li>■ Treat the environment as a programme or as a sector?</li> <li>■ Propose financial support for environment-related programmes at regional or country level?</li> <li>■ Propose active programmes to support capacity building for environment agencies?</li> <li>■ Run active programmes to integrate the environment into development planning?</li> </ul>
<b>Organisational level</b>	<b>Does the development support provider:</b>
<b>Environmental staffing and responsibilities</b>	<ul style="list-style-type: none"> <li>■ Have a dedicated environment unit?</li> <li>■ Have regional- or country-based environmental advisors?</li> <li>■ Offer environmental training for non-environmental staff members?</li> </ul>
<b>Guidance on capacity development and country systems</b>	<ul style="list-style-type: none"> <li>■ Have a dedicated unit specialising in capacity development knowledge and practice?</li> <li>■ Have any internationally endorsed best practice guidance on capacity development?</li> <li>■ Offer guidance on applying best practice to support the strengthening of country systems?</li> </ul>
<b>Cross-practice programme capacity</b>	<ul style="list-style-type: none"> <li>■ Understand needs assessment and determine realistic time frames and outcome indicators?</li> <li>■ Give organisations incentives to build capacities for greening development that meets the needs of the country concerned?"</li> <li>■ Have mechanisms for cross-practice knowledge management, monitoring and evaluation?</li> </ul>
<b>Individual level</b>	<b>Does the development support provider:</b>
<b>Knowledge and experience of – environmental governance and integration, – economic and poverty-environment linkages – results-based management</b>	<ul style="list-style-type: none"> <li>■ Have any best practice guidance on capacity development?</li> <li>■ Have any best practice guidance on enhancing capacity for greening development?</li> <li>■ Have any reviews or evaluations of past initiatives to support capacity development for environmental management and governance?</li> <li>■ Have staff members with skills in programme preparation and results-based management?</li> </ul>

For each level in the framework (enabling (policy) environment, organisational and individual levels for building capacities) it identifies questions to help focus considerations and inform subsequent actions. Such a framework could be applied to analyse supply chains of products, including their re-use. Understanding the environmental dimensions of those chains would help inform what and how Scottish people and business can be *responsible global citizens with a sustainable international footprint*, as per the Environment Strategy outcome.

The undertaking of such analysis could be facilitated by agencies of government (e.g. Scottish Enterprise), or form part of toolkits for businesses and sectors in the development or revising of business plans. Such toolkits could be shared through networks and partnerships, contributing to the development of new SMEs and micro-businesses, particularly in rural areas.

Gava *et al.* (2022) report the benefits of creating and maintaining formal and informal networks across types of actors in a food system, and the role of partnerships, for advancing the sustainability of food production and consumption (e.g. in product and systems innovation, input substitution). Examples of such partnerships are the EIP Operational Groups (Rural



Development Programme sub-measure M16.1). In almost all rural development programmes in Europe, EIP projects focus on improving the competitiveness and productivity of farms in response to specific environmental challenges such as: resource preservation; improvement of soil and water management; climate mitigation; adaptation to climate change; preservation of biological diversity and ecosystems; reduction of emissions; and animal welfare.

Other examples of cooperation measures in agriculture support are under the Rural Development Programme Sub-measure M16.5 which provides '*support for joint action undertaken with a view to mitigating or adapting to climate change, and for joint approaches to environmental projects and ongoing environmental practices*'), and those of the innovation hubs supported through the EU Innovation Fund.

The concept of the [EIP Operational Groups](#) of EU DG Agri could be extended outwith the agricultural sector. The model of EIP Operational Groups can be adapted for use in food and drink systems and supply chains, and other products with footprints which are international in extent, both for the supply of raw materials and re- or post-use. Such groups could have significant roles in building capacity of actors whether in policy teams, businesses, NGOs or citizens. They could adapt other established approaches to developing capacities with the agriculture sector, designing equivalents to 'monitor farms' and peer-to-peer learning which can disseminate on-the-ground experiences, best practices, and lessons learnt.

Benefit could be gained from approaches that harness citizen capabilities as observers of products and processes, and so contribute to monitoring of practices. Technical capacities with social frameworks can provide new products to common standards, across international borders, of which [OpenStreetMap](#) is an example. Such citizen science initiatives offer the potential for sharing information and ideas, including the use of environmental information to which rights are enshrined in the Aarhus Convention on access to environmental information ([UNECE, 1998](#)).

Associated with building capacity amongst public and private sectors, and citizens, is incentivising and celebrating best practice. Mechanisms include the recognition of behaviours through awards and prizes. Three examples of such awards are:

- i) The [Australian National Landcare Awards](#), held every 2 years, include a category of Australian Government Landcare Farming Award. Its requirements include a reduction in GHG emissions; increased biodiversity; increased ground cover particularly during periodic seasonal feed gaps, reduced soil erosion, improved management and handling of livestock to provide both animal welfare, development of innovative practices and improved natural resource management outcomes.

- ii) [New Zealand Sustainable Business Awards](#), which include an award of Going Circular. This rewards innovative product, material or service design, product life extension (e.g. by repair, remanufacturing or reuse), product stewardship, dematerialisation, 'product as a service', the 'sharing economy', or creating value from waste).
- iii) The [Nature of Scotland Awards](#) include a category of Business for Nature. The award criteria includes, "Explain how your business has taken steps to tackle biodiversity loss, actively reduced its environmental footprint or gone above and beyond normal business practice to benefit nature." Developing an award alongside this criterion, which delivers on specified objectives of the Environment Strategy, would contribute to celebrating success as well as generating positive messages about best practices.

Linking aspects of the aims of the Environment Strategy with existing awards schemes could form a part of a strategy of raising awareness, creating 'champions' and leaders in different sectors of Scottish industry, and acknowledging and celebrating successes.

## 8. Conclusions

The aspirations of the Scottish Environment Strategy align with obligations under international conventions and treaties, such as the UN Sustainable Development Goals, the Paris Agreement and the Convention on Biological Diversity. It also reflects other conventions such as the UN Convention on Human Rights, and the Aarhus Convention ([UNECE, 1998](#)).

Reducing consumption of resources is a 'wicked problem', with multiple dimensions that include technical issues relating to manufacturing and production, the sourcing of raw materials, the re-use and handling of materials and waste, and the behaviours of businesses and consumers. Competing interests and potential solutions are likely to involve trade-offs being made with regard to economic growth and stability. The achievement of the Environment Strategy's Global Footprint outcome - "*We are responsible global citizens with a sustainable international footprint*" - requires changing approaches and attitudes towards the consumption of resources, including the contents of supply chains, from raw materials through to re-use.

The public, private, third sectors, and individuals all have roles to play to achieve the aim of Scotland and its people being responsible global citizens. A range of policy levers have been used at international (e.g. European Union), UK and Scottish levels to reduce international environmental impacts of consumption and production. Within the UK, some policy levers are powers reserved to the UK Government (e.g. duties on goods) and others are the responsibilities of devolved administrations (e.g. planning).

Within this review, examples of four categories of policy levers have been sourced: regulatory, economic, infrastructure-based and information-based. Insufficient time has passed since the adoption of some policy initiatives for

conclusions to be drawn on their effectiveness in achieving the impacts sought, an example of which is the creation of legally binding targets in the EU Farm to Fork Strategy. However, the examples sourced and directly associated or related research provide evidence of what can be achieved, and some of the limitations or constraints, as summarised below.

### *Regulatory levers*

- **International/multi-lateral agreements** can provide frameworks for action within states, and shared goals for collaborations between nations or regions. Such international agreements include frameworks for tackling climate change, reversing the loss of biodiversity, trading arrangements, and the shared values of the rule of law. They provide what appears to be a comprehensive basis for the Environment Strategy. However, it is likely that lessons could be learnt from strategies being developed in other jurisdictions and mapped onto the aims and actions required to achieve the Outcome Pathways of the Environment Strategy, such as the [EU Strategy for Sustainable and Circular Textiles \(European Commission, 2022\)](#).
- **Mandatory due diligence obligations** are seen as a strategy with the broadest scope for reducing environmental footprints within supply chains and align with the Environment Strategy objectives. Mandatory due diligence requires an equal engagement between demand side regulatory administration and co-construction with supply side countries, along with mechanisms for monitoring and reporting and commensurate enforcement powers in the event of failure to meet obligations. They can be linked to other policy levers, such as sustainable commodity import guarantees. However, mandatory due diligence is an authority reserved to the UK Government with a consequence that there is limited scope for its use by the Scottish Government.
- **Statutory targets and monitoring frameworks** provide the opportunity for enforceable requirements for behaviour change within businesses and supply chains by setting legally binding targets and monitoring mechanisms to assess progress. As with mandatory due diligence, statutory targets require appropriate scales of enforcement to ensure adherence to obligations. Combined with mandatory due diligence, statutory targets can help signal the direction of change required in supply chain processes and use of materials. This needs to be developed collaboratively with supply side stakeholders to meet social justice goals. The Welsh Global Footprint National Indicator, together with the work-in-progress by GFN focused on Scotland's environmental footprint, could inform the development of an equivalent indicator for Scotland.
- **Mandatory public procurement requirements** have significant potential to reduce consumption due to the volume of goods and services used by the public sector. Examples of procurement that take account of social considerations in public procurement (e.g. European Commission, 2021c) can be tailored to local and regional capabilities whilst also representing

a policy instrument with the potential to influence supply chains that sits outwith the domain of international trade.

#### *Economic levers*

- **Taxation** – From the implementation of carbon taxes in several countries (e.g. Sweden), there is evidence to suggest it can form a valuable component in an approach to migrate away from fossil fuels. However, it may not be sufficient to stop carbon leakage in sectors such as industrial production and transport. Some of these limitations are shared in the case of a possible tax on meat. While discursively speaking it could resonate with current discourses, and evidence, around the environmental impacts of meat production, in practice other variables must be considered. Governments should also consider the conditions under which cattle are raised (intense versus free range), range of meat alternative products and dietary requirements of people.
- **Sustainable commodity import guarantees** can be designed to de-risk the sourcing of commodities produced by sustainable means for inclusion within supply chains. The approach would link to mandatory due diligence and monitoring frameworks, and the use of information-based levers (e.g. auditable evidence of eligibility for certification or sustainability labels). The qualifying criteria for such guarantees can be tailored to specific supply chains and products of significance to the Scottish economy and consumption.

#### *Infrastructure-based levers*

- **Reuse infrastructure** is creating opportunities for innovation and new businesses. Such infrastructures can be co-supported through: i) UK policies of levelling up and regeneration, such as the [Inverness and Cromarty Firth Green Freeport and Forth Green Freeport](#), and the £52m start-up funding and tax reliefs being made available; and ii) regional growth funds, such as the identification of investment at Hunterston support blue, green and circular economy drivers in the [Ayrshire Growth Deal](#).
- While the Scottish **Decommissioning** Action Plan (Scottish Enterprise, 2016) has identified economic opportunities in the decommissioning of oil and gas assets, there is a need for the plan to be updated to include renewable energy infrastructure. As early as 2025 at least 300 wind turbines will have to be decommissioned, creating an urgent need to consider how to recycle their materials as a way of reducing Scotland's consumption of raw materials whilst also continuing the development of renewable energy systems.

#### *Information-based levers*

- **Certifications and eco-labelling** schemes provide standards and criteria for qualification of a process or product, and can be aspirational. They provide a basis for designations and can be used in targeting policy (e.g.

EU Farm to Fork Strategy aiming for at least 25% of the EU's agricultural land under organic farming by 2030). However, such standards can constrain businesses which are still motivated to transition to sustainability. Evidence suggests a willingness to adopt alternative strategies with closely related aims, such as transitioning to agro-ecological farm systems that include social and governance factors in their models of operation.

The Scottish Government should explore and support a Sustainability Label in accordance with the [ISO type 1 ecolabels](#) framework, learning from the Nordic Swan Ecolabel and plans by the EU, but taking account of social, governance and economic factors.

- **Capacity building** – Mechanisms for building capacity should be designed with a view to the types of actions sought to be taken by actors in policy, business, NGOs, civil society and citizens. The models of the EU EIP Focus Groups and Operational Groups provide examples of how knowledge from research and practice can be brought to bear on specific challenges with a view to simulating new technical, product or social innovations, and the sharing of experiences on tackling environmental footprints that take advantage of ways that are inclusive and collaborative. They are consistent with recommendations of investing in more collaborative ways of working, including through trade, based on shared goals and responsibilities (Global Resource Initiative, 2020). It is likely that achieving the aims of the Global Footprint Outcome Pathway will require a suite of policy levers, the combinations of which offer prospects of achieving the aim of a sustainable international footprint.

The adoption of approaches articulated by bodies such as the Centre for Global Commons and the Stockholm Resilience Centre could position Scotland in the forefront of acting on reducing the environmental footprint of its economic and consumer activities. Actions by government can be influential in providing markets and sending messages to supply chains. Procurement policies of government and the private sector can be used to ensure that evidence of approaches to minimise adverse environmental impacts throughout a supply chain is a material consideration in the awarding of contracts.

In a topic as inherently complex as environmental footprints, when evidence of success is identified and verified it should be celebrated. Means of recognition of such success could include formal awards for organisations (public, private or third sector) and individuals, the significance of which can be developed so that it becomes an aspirational achievement. Sub-divisions of such schemes can recognise particular circumstances or members of society (e.g. island communities which can be expected to have to import more than those on the mainland; young people; transitions in traditional business sectors). Such a component of implementation of the Strategy can reinforce the messages of what is meant by being 'responsible global citizens'.

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