Environmental Protection Agency

Rialtas na hÉireann
Government of Ireland

CIRCULAR INSIGHTS SERIES

GOVERNMENT INTERVENTIONS TO SUPPORT TRANSITION TO A CIRCULAR ECONOMY

ENVIRONMENTAL PROTECTION AGENCY

The EPA is responsible for protecting and improving the environment as a valuable asset for the people of Ireland. We are committed to protecting people and the environment from the harmful effects of radiation and pollution.

The work of the EPA can be divided into three main areas:

Regulation: *Implementing regulation and environmental compliance systems to deliver good environmental outcomes and target those who don't comply.*

Knowledge: *Providing high quality, targeted and timely environmental data, information and assessment to inform decision making.*

Advocacy: *Working with others to advocate for a clean, productive and well protected environment and for sustainable environmental practices.*

Our responsibilities include:

Licensing

- Large-scale industrial, waste and petrol storage activities;
- Urban waste water discharges;
- The contained use and controlled release of Genetically Modified Organisms;
- Sources of ionising radiation;
- Greenhouse gas emissions from industry and aviation through the EU Emissions Trading Scheme.

National Environmental Enforcement

- Audit and inspection of EPA licensed facilities;
- Drive the implementation of best practice in regulated activities and facilities;
- Oversee local authority responsibilities for environmental protection;
- Regulate the quality of public drinking water and enforce urban waste water discharge authorisations;
- Assess and report on public and private drinking water quality;
- Coordinate a network of public service organisations to support action against environmental crime;
- Prosecute those who flout environmental law and damage the environment.

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- Implement and enforce waste regulations including national enforcement issues;
- Prepare and publish national waste statistics and the National Hazardous Waste Management Plan;
- Develop and implement the National Waste Prevention Programme;
- Implement and report on legislation on the control of chemicals in the environment.

Water Management

- Engage with national and regional governance and operational structures to implement the Water Framework Directive;
- Monitor, assess and report on the quality of rivers, lakes, transitional and coastal waters, bathing waters and groundwaters, and measurement of water levels and river flows.

Climate Science & Climate Change

- Publish Ireland's greenhouse gas emission inventories and projections;
- Provide the Secretariat to the Climate Change Advisory Council and support to the National Dialogue on Climate Action;
- Support National, EU and UN Climate Science and Policy development activities.

Environmental Monitoring & Assessment

- Design and implement national environmental monitoring systems: technology, data management, analysis and forecasting;
- Produce the State of Ireland's Environment and Indicator Reports;
- Monitor air quality and implement the EU Clean Air for Europe Directive, the Convention on Long Range Transboundary Air Pollution, and the National Emissions Ceiling Directive;
- Oversee the implementation of the Environmental Noise Directive;
- Assess the impact of proposed plans and programmes on the Irish environment.
- Environmental Research and Development
- Coordinate and fund national environmental research activity to identify pressures, inform policy and provide solutions;
- Collaborate with national and EU environmental research activity.

Radiological Protection

- Monitoring radiation levels and assess public exposure to ionising radiation and electromagnetic fields;
- Assist in developing national plans for emergencies arising from nuclear accidents;
- Monitor developments abroad relating to nuclear installations and radiological safety;
- Provide, or oversee the provision of, specialist radiation protection services.

Guidance, Awareness Raising, and Accessible Information

- Provide independent evidence-based reporting, advice and guidance to Government, industry and the public on environmental and radiological protection topics;
- Promote the link between health and wellbeing, the economy and a clean environment;
- Promote environmental awareness including supporting behaviours for resource efficiency and climate transition;
- Promote radon testing in homes and workplaces and encourage remediation where necessary.

Partnership and networking

- Work with international and national agencies, regional and local authorities, non-governmental organisations, representative bodies and government departments to deliver environmental and radiological protection, research coordination and science-based decision making.

Management and structure of the EPA

The EPA is managed by a full time Board, consisting of a Director General and five Directors. The work is carried out across five Offices:

- Office of Environmental Sustainability
- Office of Environmental Enforcement
- Office of Evidence and Assessment
- Office of Radiation Protection and Environmental Monitoring
- Office of Communications and Corporate Services

The EPA is assisted by advisory committees who meet regularly to discuss issues of concern and provide advice to the Board.

Circular Insights

Government interventions to Support Transition to a Circular Economy

ENVIRONMENTAL PROTECTION AGENCY

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Foreword

The Environmental Protection Agency (EPA)'s *Circular Economy Programme* is supporting the Whole of Government Circular Economy Strategy. The overall approach of the Circular Economy Programme, which incorporates the National Waste Prevention Programme, is to influence behavioural change, support sustainable choices and inform policy towards the implementation of a circular economy.

One of the pillars of the Circular Economy Programme is Advocacy, Insights, Data and Coordination. The Circular Economy Programme is commissioning a series of *Circular Insights* studies on emerging and priority topics to build evidence and fill knowledge gaps to support circular economy policy. Through analysis of data, literature review, stakeholder interviews, and assessment of best and emerging practices, it is intended that these studies will offer insights relevant to policy makers, business and other circular economy practitioners and contribute to national discussions on circular economy.

This study has been carried out by KPMG under contract to the EPA.

Executive Summary

The circular economy aims to transition away from the traditional 'take, make, consume and dispose' linear economy to a circular economy which focuses on keeping resources in use and designing out waste, ultimately supporting the climate and wider sustainability agenda.

This study has identified five categories of barriers to the uptake of a circular economy (1) the lack of meaningful data and metrics (2) regulatory (3) financial (4) behavioural, and (5) operational barriers. Stakeholder engagement and extensive desk-based research has been undertaken to identify opportunities for targeted government interventions to overcome the barriers and embed circularity across the Irish economy. These interventions are grouped under five key focus areas as set out below. The interventions include those which are already flagged in national policy and some interventions which have been implemented elsewhere that could be considered in Ireland.

Focus Area 1: Keeping Products in the Loop

Retaining the value of materials for as long as possible is a key component of any circular economy. The design stage is a critical period for determining the efficiency and durability of a product over time, and ultimately how easily its components can be recycled. Policies which enable eco-design will ultimately see increased levels of durability, reuse, preparation for reuse/repair and recycling. Such policies are being implemented across Europe, and include 'Right to Repair', penalties for premature obsolescence, and product labelling.

Intervention opportunities:

- Integration of product lifespan criteria in product labels.
- Introduce repairability and durability product indices.
- Planned/Premature Obsolescence Penalties.
- Modernise policy & regulation pertaining to the Sharing Economy.
- Promote & facilitate innovation within the Sharing Economy.

Focus Area 2: Closing Loops

This focus area explores a variety of existing and potential future interventions that incentivise producers and consumers to acquire and manage products in a circular manner. At a procurement stage, Green Public Procurement (GPP) with circular economy principles incorporated could enable more sustainable long-term investments that encompass end of service life opportunities for products and materials to ensure value retention. GPP also has the potential to influence private procurement. Other models that empower a closed-loop system include the enhancement of existing Extended Producer Responsibility (EPR) schemes, such as Deposit Return Scheme (DRS), where increasing the scope of resource recovery models to involve a wider suite of materials could reduce the extraction of raw materials and divert further waste from final disposal.

Intervention opportunities:

- Targeted training for effective GPP and tracking of GPP implementation.
- Enhance resource recovery schemes to encompass a wider suite of materials.
- Increased resources in EPA for decision making for end-of-life waste.
- Apply a sectoral lens for end-of-waste (EoW) criteria.
- Streamline regulatory processes for end-of-waste and by-product processes.
- Engage the waste management and recycling industry in the development of DRS schemes.
- Enhanced eco-modulated fees to encompass a broader range of products.

Focus Area 3: Aligning economic policy measures with Circular Economy principles

It is essential that the appropriate economic conditions exist to incentivise the right activities for circular outcomes. Financial incentives, such as taxes and subsidies, have the capacity to target unsustainable resource extraction, production and consumption. By intervening at various stages of the supply chain, a circular taxation framework could play a key role in the transition towards a circular economy. At the production stage, tax applications could incentivise the use of secondary raw materials by subsidising the use of these materials and increasing the Value Added Tax (VAT) on virgin raw materials, as well as imposing a tax on single-use products at the point of purchase. During the consumption/use stage, consumers must be empowered to prolong the life of products through effective repair and reuse schemes. At the end-of-life stage, 'graded' tax schemes could be introduced to incentivise recycling and responsible disposal.

Intervention opportunities:

- Introduce further raw/virgin material use tax and/or tax relief for secondary raw material use.
- Introduce VAT for a wider variety of single use items.
- Introduce a VAT relief programme for reuse, repairs, the sharing economy, and other circular economy activities and business models.
- Implement a graded tax regime for end-of-life management.
- Tax benefits, innovation credits and grants.
- Identify and phase out subsidies that favour the linear economy.

Focus Area 4: Investing in the Circular Economy

Strategic investment and funding models will play a key role in the pivot towards circularity. Targeted investment in infrastructure, product innovation, business model adaptation, and technology solutions will create a suite of enabling components of an efficient circular economy. Addressing the skills gap in this area through funded capacity building for the existing workforce will see improved efficiency across sectors where circular practices are needed most, such as construction, agriculture, research and development, and consumer goods.

Intervention opportunities:

- Third-level curriculum additions & enhanced apprenticeships for Circular Economy.
- Enhanced innovation funding programmes.
- Review of existing CE funding models is undertaken to identify gaps and overlaps.
- Implement 'green deals' between government and non-governmental organisations, businesses and research groups.

Focus Area 5: Collaboration

A holistic approach from whole of government and whole of society is a critical element for a successful circular economy. Enhanced collaboration is not only required across government departments to ensure a cohesive approach (such as the Whole of Government Circular Economy Strategy), but also among several actors across the public and private sector, NGOs, and social enterprises. A key enabling factor for circularity is national and international policy alignment to ensure a systematic approach whereby policies and regulations are complimentary rather than inhibiting and co-ordinated so as to avoid duplication. Policy pilot schemes, such as regulatory sandboxes, could be employed to trial and experiment innovative circular economy solutions without breaching existing legislation. This type of scheme allows for diverse stakeholder engagement to identify CE barriers within existing policies.

Intervention opportunities:

- Integrate circular economy policy across government departments through activation of the inter-departmental Circular Economy Working Group.
- Develop sectoral circular economy roadmaps through coordination between government departments and wider stakeholders (including agencies setting standards).
- Enhance coordination between regional and local offices, for instance between Regional Waste
- Management Planning Offices (RWMPO)s, Climate Action Regional Offices (CAROs), local authorities and Local Enterprise Office (LEO) staff.
- Government should mandate that all government bodies draw up and implement circular action plans, building on existing Resource Efficiency Action Plans that are required across government departments.
- The Irish Government to act as a knowledge share broker for resource exchange and efficiency (for example, through the creation of a national circular economy platform).
- Assist in the monitoring and reporting of Eurostat circular economy indicators.
- Facilitate industrial symbiosis1 services.
- Support regulatory sandbox mechanisms.
- Commission awareness raising campaigns

1. Introduction

The circular economy is a largely untapped €1.8 trillion opportunity[1] and a key instrument to help achieve the Paris Agreement 1.5°C target[2]. The circular economy aims to move away from the traditional 'take, make, consume and dispose' linear economy and promote longevity, optimal (re)use as well as a focus on reducing the use of raw materials. Improved resource use is critical to achieving our climate ambitions and sustainable development, which is reflected in the growing number of policies, plans and strategies that aim to transition existing linear economies to circular economies.

Aims and Objectives

The overarching aim of this paper is to inform and educate policymakers, businesses and individuals on the potential government interventions, both legal and financial, that can be implemented in Ireland to add economic value **through** circular activities.

The following sections of this report provide (1) an overview of the existing policy landscape at a global, European, national, and regional level, Appendix A (2) a description of the key barriers facing the transition to a circular economy (3) a discussion and identification of the key government interventions informed by a desk-based review and analysis of policy, leading industry reports, academic literature and best practice case studies as well as an extensive stakeholder engagement exercise. More detail on the stakeholder engagement process is included in Appendix Bb.

1 *McKinsey Centre for Business and Environment*

2 *UNFCCC*

2. Barriers to circular economy uptake

Although not a new concept, the uptake and transition to a global circular economy has been slow to date - **the global economy is currently estimated to be less than 9% circular**[3]**.** Ireland is significantly trailing behind its European counterparts with a current circularity rate of 1.6% compared with an EU average of 11.9%.[4]

To achieve global, EU level and national goals and ambitions, underpinned by the policy and legislative landscape, considerably more attention and understanding of potential barriers inhibiting uptake is required. It is necessary to rethink the role the government can play in providing targeted enablers and interventions to accelerate the transition to a more circular way of thinking and living. Here we provide a summary of the main barriers we see on the road to a circular economy, and later, discuss a variety of case studies from other regions, with a suite of suggested recommendations to enable a more circular economy.

2.1 DATA AND METRICS

Data and circularity metrics are key elements of gauging the level of progress for circular economy transitioning. While metrics are available for grants, funding and taxes related to circularity, and circular indicators exist, such as *Eurostat circular economy indicators*, to monitor circular economy performance, there is opportunity for government interventions to introduce tracking mechanisms. As similar waste metrics and European targets are already being monitored by the EPA, there is an opportunity to use existing databases and upscale data collection to include such indicators. Although there are measurements currently being used sporadically, such as the circularity rate, there is no standardised approach across global circular economies that allow meaningful assessments to be made. There is emerging research in this area, such as the WBCSD Circular Transition Indicator framework[5] that could also be scaled up to improve measurement and monitoring of circular activities. Clear metrics, such as those used for carbon emissions reporting, will be key to establishing baselines from which to build circularity from. Additionally, the Eurostat circular economy indicators could be used more effectively at a national level. This could be achieved through opportunity identification for monitoring and reporting metrics to identify improvement areas.

2.2 REGULATORY

Across economies, there are standards, legislation and regulations, designed based on a linear economy that unintentionally inhibit innovation and flexibility to embrace and enable circular solutions. Although the philosophy of the circular economy is relatively easy to understand, it is challenging to put into practice. Despite there being several small-scale pilot projects underway (e.g. via regulatory sandboxes), there is a need for similar projects to be conducted on a much larger scale (e.g. circular cities). Circular economy policies are complex and cannot comprehensively be regulated through a single policy or regulatory instrument. As a result, a mix of complex and overlapping policies and regulations exist, both promoting circular economy and hampering circularity.

End of Waste (EoW) criteria are crucial for a well-functioning secondary raw materials market. EoW criteria boost circular value chains by placing emphasis on quality and alleviating administrative barriers to raw material reuse and recycling. However, criteria currently only encompass a restricted list of materials and lacks consistency across the EU. A lack of EU-wide harmony restricts the flow of materials

3 *Van Houten & Ishii (2020)*

4 *Whole of Government Circular Economy Strategy*

5 *World Business Council for Sustainable Development*

across borders. The European Commission has acknowledged this and in response plans to develop EoW criteria for specific waste streams beyond those already in place (iron, steel and aluminium scrap, glass cullet and copper scrap). It is crucial that national policy follows suit and that harmonisation between EU and Irish policy is realised. With clear legislation comes transparency and the retention and re-use of valuable materials.

In addition, the presence of obstructing laws and regulations prove an inhibitor to circularity. In the agricultural sector for example, current EU rules classify certain agricultural residues as waste, thereby restricting their use as biomass to produce renewable energy. The sector would therefore benefit from a reassessment of regulations to identify potential for the Circular Economy[6]. Current laws and regulations, although at their surface intended for the right reasons, have been created for a linear economy. When transitioning to a circular economic model these regulations need to be re-assessed and updated to reflect this modernised economic approach, however, it is important that they retain their initial intended purpose and that unintended consequences are not created upon re-assessment.

2.3 FINANCIAL

The low price of virgin materials and new products compared to the cost of repair and reuse coupled with a lack of product longevity creates a financial barrier to the uptake of circular products and/or services. Social inequality also plays a part here – where western economies have outsourced a lot of production to low-income countries which is cheaper than the labour hours for repairing a product in their own country.

In addition, high upfront investment costs associated with the circular revenue models exist – buying something new is cheaper than repairing existing goods or products. Due to a lack of market readiness and in turn scalability, the prospect of high returns for potential investors in repair and reuse services is low. As such, the attractiveness of such circular revenue business models is significantly reduced due to low financial reward. Another financial barrier is that the current financial model favours linear models rather than circular models. These challenges are compounded by the lack of sufficient governmental financial support, subsidies, and incentives for the circular economy. Subsidies and supportive taxation, such as design, reuse, repair and recycling policies, could lower companies' risk and attract investment.[7]

2.4 BEHAVIOURAL

Circularity is an unfamiliar topic for most consumers. Although climate change and climate action are commonplace topics, the concept of a circular economy is not at the forefront of consumers' minds. The consumer prioritises familiarity, the mindset of make, use, dispose is engrained in our population and thus intervention in the form of awareness building is crucial to shift the consumer mindset. Additionally, consumers are provided with few incentives to engage in more sustainable behaviour, leading to minimal demand for circular solutions (although it is important to note that interest is slowly increasing).[8,9]

In addition, the circular economy can challenge personal/individual status and the desire for 'owning' goods and/or services. The transition away from this desire for ownership is a generational trend, for example, Generation X typically enjoys and values 'ownership' of goods and services, which may be a result of current production models that campaign for linear and fast-moving-consumer-goods that appeal to this generation. However, later generations, including Generation Z, prefer an 'unburdening' and are less concerned about owning these goods or services, aligning with circular economy principles[10].

6 *Rizos et. al (2021)*

7 *Turunen et. al (2021)*, *Kirchherr et. al (2017*), *Rizos et. al (2021)*, *Tura et. al (2019*), *CSR Europe (2018)*

8 *Rizos et. al (2021)*

9 *Kirchherr et. al (2017*)

10 *Generation Green*

A circular business model conflicts with existing business culture. Many businesses are stuck in static and conservative models which hamper business transformation and limits the circular engagement of the organisation. Moreover, discussions on circular economy do not seem to reach high-level management and thus remain niche discussions within an organisation with few commitments made.[11,12]

Transitioning to a circular economy will require various new skills and knowledge, which to date have not been widely developed. Enterprises will require a multitude of innovations when they decide to integrate circularity into their practices which will require individuals with the necessary technical expertise. A survey conducted by the Stockholm Environmental Institute noted that only 35% of respondents had received training on topics related to circular economy, further highlighting the general lack of expertise in the sector[13]. Embracing digital solutions as an enabling agent for a circular economy, Ireland aims to increase the share of adults with at least basic digital skills to 80% by 2030 (compared to approximately 53% in 2019[14]) and to increase the number of individuals with higher-level digital skills to over 12,400 graduates, apprentices, and trainees by end-2022.[15]

2.5 OPERATIONAL

The challenges associated with operating a circular supply chain act as a barrier to the adoption of a circular economy model. The lack of network support and suitable partners for collaboration reduces the number of available resources, in turn hindering the establishment of a circular supply chain.

In addition, the lack of transparency and traceability along complex supply chains makes ensuring and monitoring circularity uptake difficult. Although traceability tools and solutions exist, engaging all actors involved along the supply chain proves challenging. Regulation is key here too - although tools and solutions are present, their use can be restricted by data privacy and sensitivity regulations and laws. From an operational point of view, small to medium sized enterprises (SMEs) are in a unique position - the adoption of circular solutions is often impaired by a lack of internal capacity and resources as well as an understanding of the technical aspects of embedding circularity. However, often SMEs can adapt to new circumstances relatively easily due to their size. Support to adopt circularity is therefore needed for SMEs to embrace this unique position and to overcome the operational barriers. Even when capacity or traceability is not an issue, for large and established companies for example, convincing stakeholders to adopt a circular approach and furthermore accept the approach, is difficult.[16,17]

Companies and organisations have concerns regarding the complexity and limited availability of circular technological solutions, with particular focus on the lack of large-scale pilot projects and their subsequent scalability. Technological barriers, however, are not seen as the main barriers to the circular economy model and technology is largely regarded as an enabler for the circular economy agenda.[18,19]

11 *Kirchherr et. al (2017)*

12 *CSR Europe (2018)*

13 *Melati et. al (2021)*

14 *https://digital-strategy.ec.europa.eu/en/policies/countries-digitisation-performance*

15 *https://www.gov.ie/en/publication/adf42-harnessing-digital-the-digital-ireland-framework/*

16 *Kirchherr et. al (2017*)

17 *Tura et. al (2019*)

18 *Kirchherr et. al (2017*)

19 *Rizos et. al (2021)*

3. Insights & Opportunities

This section discusses insights gathered from the stakeholder engagement exercise and the extensive desk-based literature review, specifically targeting the identified barriers to the uptake and embedding of the circular economy through government interventions.

Circularity is becoming increasingly embedded across global, EU and national policy. Government plays a crucial and fundamental role in Ireland's transition to a circular economy - there already exists circular interventions implemented by the Irish government, including the plastic bag levy, landfill levy and the future 'latte levy'. However, more action and understanding of the government's role to co-ordinate and support the circular transition is vital.

Our approach has identified key focus areas or themes which play a role in the transition to a circular economy. Under each opportunities for targeted government interventions are identified which can be used to improve and embed circularity across Ireland.

3.1 FOCUS AREA 1: KEEPING RESOURCES IN THE LOOP

In transitioning to a circular economy, the way we take, make, use, and consume products must change. Government has a key role to play in supporting this change by enabling circular decisions to be made right at the start of the design process. As the design stage determines how we make, use, and consume products, it also determines if a product will retain its value after many uses or simply become waste. Therefore, policies which enable circular design allow for reduced consumption of resources in production, opportunities for increased durability, re-use and repair and ultimately reduce end-of-life waste and raw material extraction. In practice, this means supporting eco-design approaches such as design for durability, increased reusability and repairability, remanufacturing potential and/or a recyclability requirement[20].

Examples of such innovative product policies that could extend the use of materials and/or products by supporting re-use and repair markets include legislation that strengthens the user's 'right to repair', penalties on planned or premature obsolescence, product labels and market incentives for secondary material usage and thereby supporting the emergence of a secondary materials market.

3.1.1 RIGHT TO REPAIR, PREMATURE OBSOLESCENCE & PRODUCT LABELS

According to a Eurobarometer survey, 77% of EU citizens would rather repair their appliances than replace them, however they tend to replace them due to high costs associated with repair. Moreover, a lack of availability of spare parts means that it is sometimes impossible to repair and ultimately re-use a product.[21] Governments can thus support the uptake of re-use and repair through several measures summarised below:

Product labels pertaining to product lifespan criteria (e.g. durability, material content, upgradeability, reuse, repair, and recycling options) would strengthen consumers' ability to make informed choices by allowing them to opt for longer-lived products or to repair products and re-use them over longer timeframes. This can be taken a step further, with product labels also providing information on where to repair or how long spare parts will be available, thereby encouraging consumers to repair and re-use their products. Such lifespan criteria on product labels are currently niche and have a low uptake. Lessons can be learned however from the French Repair Index, the world's first mandatory repairing

20 *Ellen MacArthur Foundation: Universal Circular Economy Policy Goals*

21 French *Repair Index*

score, which stipulates a mandatory repairability score for products across five categories: smartphones, laptops, washing machines, TVs, and lawn mowers. The index serves to fulfil two purposes:

- to inform consumers at the point of purchase on the repairability of a product, and;
- to push manufacturers to sell more repairable products in order to improve their score.

Upon examination of the initiative one year on from its implementation, it was found that 55% of polled consumers knew about the repair index and that one third of these took it into consideration when purchasing a new product[22]. Although still in its infancy, it is already evident that the implementation of the repair index in France has positively impacted consumer decision making, in turn promoting circularity.Crediting the success of the index, the French government are now looking to develop a durability index, which will expand the current index to further categories and include additional criteria such as product reliability.

In support of the consumer's 'Right to Repair', **government enforced penalties for planned or premature obsolescence** can aid in keeping products in the re-use loop. Planned or premature obsolescence refers to the policy of planning or designing a product with an artificially limited useful lifespan or a purposely frail design, so that it becomes obsolete after a certain pre-determined period of time. Examples include slowed down mobile phones, protected ink cartridges and marginally modified textbooks[23]. In the United Kingdom, new legislation has come into effect to tackle premature obsolescence in electrical goods which includes a legal requirement on manufacturers to make spare parts available to consumers with the aim of extending the lifespan of products by up to ten years and in turn reducing the 1.5 million tonnes of electrical waste generated in the UK annually[24].

Similarly, countries such as Belgium, France and Germany have taken steps to address the deliberate destruction and disposal of unsold or returned goods. Unsold or returned textiles and electronics are destroyed at an alarming rate which is only exacerbated by the rise in e0commernce and business strategies such as fast fashion. Okopol and the European Environmental Bureau urged the EU Commission, in a 2021 policy briefing, to build on national solutions and ban the destruction of unsold goods at the EU level[25].

Governments can set price and fiscal incentives for repair services to encourage consumers to re-use their products instead of purchasing new ones. According to a study conducted by ADEME, people tend to repair their products if the cost of repair does not exceed 30 – 50% of the price of a new product. Governments could consider introducing reduced or zero-rated VAT on the sale of second-hand goods and repair services. This would not only increase the uptake of re-use and repair but also lead to local job creation.

Introducing 'Right to Repair' and 'Premature/Planned Obsolescence' legislation can serve to increase the availability of parts for repair, promote competition between manufacturers and incentivise designs for upgradeability and adaptability[26]. These can then be further supported through financial and fiscal incentives, all ultimately contributing to the transition to a circular economy. These criteria are set to come into effect under the EU Green Deal but it is important that member states further define these criteria around specific sectors and industries to support greater transparency, alignment and uptake.

22 *Repair EU*

23 *Durability Matters*

24 *The Ecologist*

25 *EEB*

26 *Ellen MacArthur Foundation: Universal Circular Economy Policy Goals*

There is a strong connection between the sharing economy and the circular economy with both their foundations based in resource efficiency. The sharing economy can be defined as an economic system in which assets or services are shared between private individuals, either free or for a fee, typically by means of the internet. The sharing economy not only supports but can promote the transition to a circular economy by keeping products in the loop, in turn facilitating resource reuse and reducing consumer consumption. An example of the sharing economy is individuals renting their personal vehicles for others' use, whereby you would only rent a car when really needed instead of purchasing one. Tool libraries are another example of the sharing economy, where individuals can borrow various items with the main goal of reducing household consumption through the sharing of resources. Consumers have shown a strong interest in the sharing economy; however policymakers have been slow to act and thus there is an opportunity for government intervention.

In support of the sharing economy, government needs to modernise policy and regulatory approaches towards this model. Traditional regulation often operated together with professional organisations that would self-police their industries to ensure quality. The sharing economy does not fit easily into this traditional model, creating misalignment of regulation. These old models of self-regulation often act as a barrier to innovation. For example, the battle between the taxicab industries and ride-sharing platforms highlights this misalignment in regulation. Taxi quality was typically controlled through cooperation between governments and large taxi fleet companies, however, with the introduction of ride-sharing platforms this dynamic was threatened. This misalignment led to many countries outright banning ride-sharing platforms, for example in Belgium and Germany. Instead of applying old regulatory approaches to innovative business models, government should address this misalignment through the reviewing and updating of policy where applicable[27]. Similarly, the government should stimulate innovation for the sharing economy, for example by instigating and supporting pilot programs where service providers can test their businesses in the community for a given amount of time which in turn allows policy makers to shape their response based on actual data.

Case Study: BAMB Material Passports[28]:

The EU funded Buildings as Material Banks (BAMB) project brings 15 parties throughout Europe together with a mission to enable the shift to a circular building sector through the use of electronic material passports. Their material passports make crucial information easily accessible allowing for the effective recovery and reuse of components, products, or materials in buildings. Material Passports developed in BAMB are sets of data describing defined characteristics of materials in products that give them value for recovery and reuse. Within the project, more than 300 Materials Passports for various products, components or materials have been developed together with a software solution. BAMB has similarly developed a Materials Passport platform which will fill a gap in the marketplace by providing a 'one-stop-shop' to describe Circular Economy value across the building cycle. BAMB Material Passports aim to:

- Increase the value or keep the value of materials, products and components over time
- Create incentives for suppliers to produce healthy, sustainable, and circular materials/building products
- Support materials choices in Reversible Building Design projects
- Make it easier for developers, managers and renovators to choose healthy, sustainable and circular building materials
- Facilitate reversed logistics and take back of products, materials and components

27 *Urs Gasser (2016)*

28 *BAMB*

Intervention Opportunities – Keeping Resources in the Loop

Intervention	Desired Outcome	Sector(s) where intervention can be applied
Integration of product lifespan criteria in product labels	Government can strengthen the consumer 'right to repair' by introducing mandatory disclosure requirements pertaining to product lifespan (e.g. durability and repairability scoring). Such product labels may include a repairability index or durability index.	• Whole of government • Consumer goods
Planned/ Premature Obsolescence Penalties	Government can introduce penalties for planned/ premature obsolescence so as to increase the durability of products. Focus can initially be made on the electronics sector with expansion thereafter. Government can also penalise or ban the destruction or disposal of unsold/returned goods.	• Electronics Sector (short-term) • Cross-sector (long-term)
Modernise policy & regulation pertaining to the sharing economy	Through stakeholder engagement, Government can develop an understanding of which policies act as barriers to the uptake of the sharing economy, and from this reassess and modernise such policies where applicable	• Industry • Whole of Government
Promote & Facilitate Innovation within the Sharing Economy	Government can implement pilot programmes where communities and service providers can test aspects of the sharing economy with the required assistance and support from the government. From this, policy makers can use actual data and results to reassess and modernise policy	• Consumers • Industry • Whole of Government
Sharing Economy GPP Inclusion	Government should include aspects of the sharing economy in GPP guidance/criteria, where not already done so, as to promote the uptake of the sharing economy	• Policy makers

3.2 FOCUS AREA 2: CLOSING LOOPS

The creation of high-value resource loops using government interventions to target particular stages along a supply chain can be impactful in improving efficiencies and promoting circularity.

3.2.1 EXTENDED PRODUCER RESPONSIBILITY

Extended Producer Responsibility (EPR) schemes are viewed as an effective measure for incentivising producers to bring higher-quality goods to the market. Increasing the financial and/or physical responsibility of post-consumer products for these producers incentivises the reduction of waste at the source, supporting better product design and public recycling[29]. There are three primary mechanisms that may be utilised for promoting and implementing an EPR scheme[30]:

1. Implementing a mandatory cost to compensate for environmental impacts (e.g. carbon tax);
2. Voluntary or mandatory deposit-value schemes for the incentivisation of consumers to return waste products (e.g. deposit return schemes for glass/plastic bottles);

Take-back schemes that are facilitated by external parties (e.g. producer responsibility organisations) that perform the recycling/reuse duties of the products (e.g. Waste from Electrical and Electronic Equipment (WEEE) enabling organisations).

EPR schemes have been implemented across Europe in many different ways, with varying results. In Ireland, an example of a successful EPR scheme is the WEEE initiative, which aims to deliver cost-effective compliance on behalf of its electrical and electronic equipment members[31]. Other materials that are subject to producer responsibility initiatives (PRIs) in Ireland include packaging, tyres, farm plastics, end-of-life vehicles (ELVs) and batteries. In some cases, there are legislative targets to be met, in other cases there are performance criteria in the compliance scheme's authorisation from the government.

As EPR is used as a policy tool to internalise the end-of-life costs into the producer's price and therefore creating an incentive to consider environmental aspects (i.e. waste prevention, durability, hazardous materials etc.), it is important that greater harmonisation of EPR schemes across the EU is achieved via standardised criteria for waste management, and also to enhance the performance of existing schemes through clear allocation of responsibilities among various stakeholders, including monitoring, enforcement, and implementation of sanctions[32]. In essence, the role of an EPR is to ensure compliance, and such government interventions in this space could help navigate this better through a statutory footing and enhanced monitoring and regulations.

In the packaging EPR scheme, eco modulated fees also play an important role in the reduction of packaging waste and promoting recycling. Fee modulation can be applied within an EPR scheme whereby the fees paid by a producer will vary according to different criteria relating to their product's environmental performance, with products that are least impactful on the environment having the lowest fees. While some materials have relatively straightforward criteria for modulated fees, such as the recyclability of plastic packaging, other waste materials like batteries and EEE are more subjective, with some suggested criteria including ease of disassembly, availability of spare parts, and warranty fee periods[33]. In Ireland, Repak currently operates the eco-modulated fees for plastics, with producers paying 80% of the net necessary costs of recovering packaging waste, which include operation costs (i.e.,

29 *OECD Extended Producer Responsibility*

30 *Copper8 Circular Revenue Models*

31 *WEEE:*

32 *Pouikli (2020)*

33 *Eunomia Modulated Fees*

collection and processing)[34]. Other examples of EPR incentivising a circular economy in Ireland would include recycling targets that have been set by the EU, such as 60% glass recycling, 50% metal recycling, 60% paper recycling, and 22.5% plastic recycling[35].

Deposit Return Scheme

Deposit Return Schemes (DRS) have been implemented widely across the globe as an incentive for consumers to return their waste products (plastic bottles, glass bottles etc.) so that they can be recycled into secondary raw materials. These schemes can have varying success rates, with the highest return rates being found in the Nordic countries, with rates of 88%-96%[36].

The Norwegian DRS model i is operated by Infinitum[37], an industry owned company in Norway. The company is incentivised to run the scheme efficiently due to an environmental tax being placed on plastic bottle producers, which is waived if a return rate of 95% is achieved. As the industry itself is in control of the Norwegian DRS, the motivation via the tax reduction has led to favourable statistics, with 97% of all plastic containers being returned, and 92% of these being recycled into new products. As Ireland rolls out its own DRS in 2022, there are several lessons that can be learned from the leading example of Norway. The waste management and recycling industry should be engaged from the outset, with appropriate incentives in place to ensure efficiency. Moreover, adequate facilities must be in place to recycle and repurpose the influx of returned products through the scheme. At a production level, manufacturers should also be engaged to ensure that their products are easily recycled at end-of-life, and this could be incentivised through the EPR model. Moreover, manufacturers should also be incentivised to utilise recycled materials in the design phase of products in order to increase market demand for secondary raw materials.

DRS models can also be utilised for materials other than plastic bottles and aluminium cans (which are the focus of Ireland's DRS being rolled out in 2022). One criticism of Ireland's upcoming DRS is the exclusion of glass containers[38]. Schemes which include a range of different materials have been widely implemented around the globe, such as Israel, where a DRS for glass and plastic containers has been in place since 2001. In Ireland, glass recovery has been a huge success, with a collection rate of 87% (EU target 60%), however glass is not currently included in any DRS' in Ireland. A cost-benefit analysis of this specific DRS found that the scheme had a positive impact, with benefits exceeding total costs by ~35%, with potential for further benefits if containers larger than 1.5L were accepted[39]. As outlined in the WAPCE, the EU Commission is proposing a comprehensive EU strategy for textiles which will aim to strengthen industrial competitiveness and innovation, while boosting the market for textiles and textile reuse[40]. While not currently included in DRS's, there is potential for textiles to be included as a target material for EPR measures. The EU Textile Strategy is one among several other initiatives addressing sustainability and consumer transparency. The strategy will address a number of issues, including eco-design of textiles and incentivising circular business models in this industry; enabling better recycling and improved production of materials; and ensuring increased transparency for consumers along the entire value chain[41]. Moreover, the EU has also set a requirement under the WFD for member states to set up

34 *Repak Eco Modulated Fees*

35 *REPAK*

36 *The knowledge exchange*

37 *Infinitum*

38 *The Irish Times*

39 *OECD Deposit Return Schemes*

40 *Waste Action Plan for a Circular Economy*

41 *EU Textile Strategy*

separate textile waste collection systems for textiles by January 2025[42].

Resource recovery models, such as DRS, recycle and reprocess a range of materials into secondary raw materials, which further diverts waste from final disposal as well as avoiding the extraction and processing of virgin raw materials. To make this process more efficient, there is a need for cohesive policy alignments for transitioning to a circular economy which should include policies across communities, all government levels, and stakeholders. An example of a policy misalignment that has hampered the secondary materials market is trade restrictions (e.g., on exported raw materials and used goods). An example of export restrictions having a negative impact on the economy was identified in the mining sector in 4 African countries, whereby restrictions on different minerals and metals has substantial negative impacts in the mining sectors[43]. Such restrictions lower the opportunities for the recovery and reuse of materials, therefore hampering resource efficiency[44].

3.2.2 GREEN PUBLIC PROCUREMENT

Green Public Procurement (GPP) should be implemented as a government intervention to accelerate the demand for more circular products and services. Recognising that public authorities are major consumers and have the power to source goods and services with a reduced environmental impact, the use of green public procurement also has the potential to influence greener private procurement. GPP has seen increased emphasis in several policies and strategies in the circular economy space, such as the Waste Action Plan for a Circular Economy, the Whole of Government Circular Economy Strategy, and the 2020 Programme for Government.

Although GPP is largely being utilised as a voluntary instrument in Europe (with a small number of states and cities with mandatory targets), it should be recognised that GPP can play a central role in the transition to a more circular economy if there is enhanced guidance for products and services within the procurement process, such the inclusion of clear and verifiable environmental criteria[45]. The EPA published revised 'Green Public Procurement Guidance for the Public Sector' including ten criteria sets in 2021 which addresses this need; however the challenge remains to increase its uptake by public sector bodies.

The level of uptake can be increased through a number of factors, including awareness raising, increasing the support of external experts for public authorities, and broadening the scope of public authorities to adopt GPP practices/strategies[46]. The Irish Government have also flagged the importance of GPP in the transition to a circular economy, stating that green criteria will be mandated in all procurements using public funds by June 2023[47]. Several examples of European best practice on GPP are outlined on the European Commission website that cover a range of products/services from buildings to cleaning products[48]. A key example of implementing GPP policies was conducted in Barcelona, Spain in 2016. The city council has developed a +Sustainable City Council Programme (+SCC) that seeks to reduce environmental and social impacts, promote a green economy and production system, and make the city council more coherent with the environmental and social agendas, and to lead by example. With 12 targets for responsible procurement, the city council took a policy approach that tackled discreet elements including products and services, awareness raising and training of municipal staff,

42 *CEAP Questions*

43 *OECD*

44 *OECD Towards a more Resource Efficient and Circular Economy*

45 *European Commission Green Public Procurement*

46 *Testa et al., (2021)*:

47 *Our Shared Future*

48 *European Commission GPP good practice*

network involvement and strategic partnerships. The success of the programme is largely down to the participation and co-responsibility of all stakeholders involved (internally and externally), as well as defining a common regulatory framework for all municipal contracting authorities[49]. Although Ireland now has guidance on GPP as outlined by the EPA and in the Programme for Government (which includes targets for GPP), there is an opportunity to increase collaboration between stakeholders to work on this, as well as raising awareness and upskilling relevant staff on responsible procurement. Furthermore, GPP also has the potential to demonstrate large-scale implementation of circular economy and circular business models. GPP can showcase the true financial costs of closed loop systems and demonstrate additional advantages of sustainable circular business models (for example - job creation/lower production and therefore public sector costs etc.) as well as environmental savings.

3.2.3 END-OF-WASTE LEGISLATION

Transforming waste materials into resources is a key component of any circular economy. Article 28 on end-of-waste (EoW), regulated in Ireland by the EPA, aims to achieve the appropriate end-of-waste status for recovered waste materials to support the recycling of waste and use of waste without damaging environmental or human health[50]. As per the European Communities (Waste Directive Regulations) 2011, EoW gives the waste holders the opportunity to demonstrate that the waste material can be fully recovered (i.e., no longer be considered as waste), can be used as a secondary resource to replace a virgin/raw material, can be transformed into a resource through innovations, or can be used without adverse impacts on environmental or human health[51]. Currently there are *11 cases of EoW approved by the EPA*, including recycled aggregates by Starrus Eco Holding Ltd[52] and poly(ethylene phthalate) recyclate by Shabra Recycling Ltd[53].

The implementation of EoW criteria has sometimes failed in the EU with many proposals being halted as member states fail to reach agreements on specific criteria. As a result, inconsistencies arise for materials being regarded as waste in some countries, but not in others. This leads to a regulatory barrier, which is a perceived slow and unpredictable administrative processes which are inconsistent with the speed of innovation. This perception of lengthy administrative decision-making processes and lack of predictability as to outcomes make circular economy business models unattractive to business actors and investors[54]. This is further exacerbated by the limited capacity and resources available to process decisions on EoW criteria. For Ireland to make this more effective, a possible intervention could be to introduce more resources in government/relevant bodies that are dedicated to process Article 28 requests to make the process more efficient. Moreover, it is important for industry groups to come together and seek national-level decisions on EoW criteria that would be more broadly applicable for the benefit of many players. Potential updates to legislation are currently being discussed within government to reflect Ireland's Circular Economy Act 2022 and the EPA is exploring the potential for national criteria for certain materials. Moreover, a sectoral lens could also be applied to EoW criteria (e.g. construction, packaging, agriculture etc.), and engaging relevant stakeholders, a more appropriate set of EoW guidelines could be developed to ensure sectoral efficiency.

49 *European Commission GPP in practice*

50 *EPA Article 28*

51 *ISB*

52 *EPA Starrus Eco Holding Ltd*

53 *EPA Shabra Recycling Ltd*

54 *Turunen et el., (2021)*

3.2.4 BY-PRODUCTS

Another option to enable circularity is via Article 27 of the European Communities (Waste Directive) Regulations 2011[55] relating to by-products. Article 27 makes a key distinction between the regulatory regime for materials or products that are defined as 'waste' and those that should be viewed as 'by-products'. This provides several benefits for a circular economy, with the main benefit being the encouragement of waste prevention, including the lawful and beneficial use of by-products. For a material to be considered as a by-product in Ireland, the EPA must be notified using an online platform *Environmental Data Exchange Network (EDEN)*. At the time of writing, the EPA by-product guidance note is currently in draft format, with a total of 2,303 notifications on the register covering various materials, including soil and stone, road planings, and wood[56].

Recommendations for Closing Loops

Intervention	Desired Outcome	Sector(s) where intervention can be applied
Targeted training for effective GPP and tracking of GPP implementation	Delivery of GPP training* to Government Departments/ local authorities/relevant players in the procurement space will lead to more strategic purchases that will deliver long-term value for citizens, with reduced environmental impact. This will also stimulate the growth of circular solutions. Following successful training, a tracked approach of GPP would be employed to monitor progress, and will compliment the Programme for Government's GPP target to include green criteria in public procurement by June 2023. ** EPA have developed and delivered training for public sector bodies. CAROs are developing training for local authorities and more work is underway to develop training resources/capacity between EPA,DECC and OGP. The tracking of this training will be complimentary to this.*	• Whole of government • Public sector • State agencies • Local authorities • Education sector • Cross-sectoral
Enhance resource recovery schemes to encompass a wider suite of materials	By broadening the scope of materials accepted by resource recovery models, there would be increased diversion of waste disposal from more materials (e.g., larger plastic bottles, aluminium containers, paper, textiles etc.) as well as avoided extraction and processing of raw materials.	• Waste management • Consumer goods • Manufacturing/ production
Increased resources in EPA for decision making for end-of-life waste	By increasing the capacity in the EPA to process Article 28 EoW requests, timing is improved and there is potential that an increased number of secondary resources will be made available on the market.	• State agencies
Apply a sectoral lens for EoW criteria	This intervention would lead to the development of guidelines that are specific to each sector/waste stream and will further enhance the application and approval process for EoW criteria.	• Whole of government • Cross-sectoral

55 *EPA – By-Product Notification Form Guidance*

56 *Article 27 register*

Intervention	Desired Outcome	Sector(s) where intervention can be applied
Streamline regulatory processes for reusing material considered as waste through end-of-waste and by-product processes;	As recommended in the recent OECD report[57], this would be achieved by a shift towards more performance-based or outcome-based regulation, which specifies the required outcomes of the regulation, rather than process-based regulation, which specifies the means by which regulatory objectives must be achieved. As suggested in the *WACPE WAPCE*, local authorities can take on more responsibilities in end-of-waste applications and by-product notifications. This might support the identification of local opportunities regarding bioeconomy by-products, which is a key action in the *National Policy Statement on the Bioeconomy*.	• Whole of Government • Cross-sectoral • State agencies • Waste management
Engage the waste management and recycling industry in the development of DRS schemes	By engaging appropriate players involved in the development of DRS schemes, and ensuring adequate capabilities are in place at the outset, high recovery rates will be achieved, similar to that of the Norwegian case. This would also include producers ensuring their products are as recyclable as possible. DRS models could also be enhanced by incorporating other materials, like glass containers. Furthermore, DRS models could be adapted to facilitate products rather than materials to avoid unwanted substitution effects that can occur with material-based DRS policies* **Unwanted substitution effects can occur with material-based DRS policies, whereby producers shift towards exempted materials. In several OECD countries, DRS policies identify a type of product (e.g., for beverage containers) and detail exemptions for particular types of this product category[58]*	• Whole of government • Waste management • Consumer goods • Manufacturing/ production
Enhanced eco-modulated fees to encompass a broader range of products	The government should consider EPR fee eco-modulation, based on detailed product design criteria like recycled content, which can provide producers with stronger design incentives[59]. By encompassing a broader range of materials and products in eco-modulated fee schemes, producers will be encouraged to design a wider range of products in a more environmentally friendly way and could include products that are more difficult to recycle, such as electronics.	• Whole of government • Waste management • Manufacturing/ production

57 *The Circular Economy in Ireland*

58 *OECD The Circular Economy in Ireland*

59 *OECD The Circular Economy in Ireland*

3.3 FOCUS AREA 3: ALIGNING ECONOMIC POLICY MEASURES WITH CIRCULAR ECONOMY PRINCIPLES

In order to realise the success of Focus Area 1 and 2, it is vital that adequate economic conditions exist to deliver circular outcomes. If pollution and extraction of raw materials as a primary resource are tax free/subsidised and labour costs are substantial, many businesses will face issues when trying to scale up their circular activities[60]. Financial incentives, such as taxation and subsidies, have the capacity to target unsustainable consumption, which is the primary driver of production and can also target specific areas within the market such as single-use products. Financial incentives are fundamental to secure more circular use by creating an economically attractive business model for both suppliers and consumers.

As with any government intervention that aims to facilitate a circular economy, taxation/tax relief can be introduced at varying stages of the supply chain. A taxation framework that utilises taxation at each stage could include: a raw-materials tax, a re-use tax relief, a preparation for reuse/repair tax relief, and a graded tax for end-of-life products[61].

3.3.1 PRODUCTION STAGE

At the primary resources stage, tax application could prove beneficial for circularity by incentivising the use of secondary materials for resources, however this will only achieve the latter outcome if the level of tax is high enough to create competitive pricing. Comparing the traded volume of secondary resource materials like paper, glass, and plastic, European trends display a steady growth from 2004 through to 2020 for all three materials, however there is more uncertainty with plastics as the price of 'virgin' plastic feedstock can fluctuate significantly depending on the price of crude oil[62]. Other raw materials that could be subjected to environmental taxes include construction aggregates. The aggregate industry in Europe contributes €15.2bn to the economy, however these activities have significant impacts on the environment, through extraction, landscape alteration and secondary impacts via energy consumption and transportation. A European study has identified varying results from the implementation of taxes within this area. Italy and the Czech Republic had weak evidence of improved landscapes following the introduction of environmental taxes on this industry, whereas Sweden saw reduced demand for natural gravel, which is an important resource for ensuring groundwater quality[63]. A key finding from the study identified that environmental taxes, such as those on aggregates, are more efficient when they are implemented as part of a policy packages that do not become distorted across country borders and ensure effective environmental improvements.

Taxes can also be implemented at the point-of-purchase for wasteful/single-use items such as plastic bags and coffee cups. The plastic bag environmental levy is an example of a successful financial instrument on reducing waste. A 15-cent environmental levy was placed on plastic bags in Ireland in 2002, reducing their composition in litter from 5% in 2001 to 0.13% in 2015. Moreover, this levy was increased to 22 cent in 2007, generating a total of €200m (2002-2013), which has been spent on a variety of environmental projects and administration costs[64]. Similar levies will be introduced in Ireland include the 'latte levy' which it is intended will impose an additional cost of up to 25 cents on disposable coffee cups. This is one of a number of environmental charges that are in the process of being rolled out in phases, with other levies including a an increase in the plastic bag levy (to 25 cent), take away food containers (by

60 *ACCA*

61 *Milios (2021)*

62 *Eurostat Recycling – secondary material price indicator*

63 *European Environment Agency*

64 *IEEP – plastic bag levy in Ireland*

2023), and plastic being used for baked goods, fruit and vegetables (by 2023)[65]. These levies are part of a number of environmental levies managed by the Department of Communications, Climate Action and Environment (DCCAE).

3.3.2 USE STAGE

Throughout the use stage of products, there is a need to incentivise consumers to prolong the life of products through re-use and repair. This action could be achieved through the introduction of VAT relief, which would increase the availability and affordability of re-use and repair services, thus increasing resource efficiency across the economy. This economic instrument could also address externalities along the entire value chain, by reducing the use of material and energy use, and also the potential to offset the production of new products[66]. It has also been identified that on a European scale, reduced VAT on certain products is not expected to have negative consequences on internal market functioning due to a large number of member state products not being traded outside of EU borders[67]. A tangible case of where this type of tax instrument has been implemented is in Sweden, where a 50% tax break on the repair costs of certain products was applied in 2017, which reduced the original VAT rate of 27% to 12% for a range of common products such as bicycles, washing machines and textiles[68]. The outcome of this circular economic action is that the repair industry is expected to grow in demand, spurring increased employment across the sector.

3.3.3 END-OF-LIFE STAGE

For the end-of-life product stage, an effective economic instrument to incentivise circularity could include the introduction of a 'graded' tax, whereby the tax rate applied to different waste treatments can vary depending on environmental impact (e.g., highest rate for landfilling and lowest rate for recycling). This method of tax is complimentary to the raw materials tax discussed previously, emphasising that interventions are required at both ends of the product life cycle in order to drive circularity. This approach has already been implemented across Europe with the landfill tax, where Ireland had the third highest cost per tonne in 2017 (€75/tonne, excluding UK)[69]. As the success of the landfill tax has been highlighted in a 10-year review of waste management practices[70], the introduction of a tax hierarchy for different waste treatments could achieve additional success for circularity.

Article 4 of the Waste Framework Directive states that Member States shall make use of economic instruments to provide incentives for the application of the waste hierarchy, so incentives that drive prevention (including re-use), preparation for reuse and recycling are favoured. Further end-of-life stage levies will be introduced in Ireland including the 'waste recovery levy' which will apply to recovery operations at Municipal Solid Waste (MSW) Landfills, Waste to Energy Plants and Co-Incineration Plants and the Export of MSW[71]. [72].

65 *CRNI Environmental Levies*

66 *Cooper and Gutowski (2015)*

67 *Copenhagen economics*

68 *Knowledge hub: circle lab*

69 *Statista EU landfill tax*

70 *EEA managing MSW in 32 EU countries*

71 *Waste Action Plan for a Circular Economy*

72 *Eurlex – waste hierarchy*

3.3.4 LABOUR TAX

Labour is also heavily taxed, which can act as a barrier to circular business models. By reducing labour taxes and increasing green taxes, the Irish Government will be better placed to achieve the circular ambitions set out in its strategy, and it will also enable businesses to achieve their own circular goals. This idea has been explored by the Ex'Tax project and illustrates the 'buttons' governments could press to lower labour taxes and increase taxation on the use of natural resource consumption. This project Is being explored in the Netherlands and is calling for a revision of their current tax system, focusing on opportunities to increase taxes on resources and pollution, and using the revenues to lower the tax burden on labour and invest in social impact[73]. This can be achieved through governmental and business actions, such as pricing pollution (via the removal of fossil fuel subsidies, carbon emission pricing), engaging with businesses in advance of changes, adopting a regional approach to work with other countries to align circular economy objectives, consider new circular and inclusive business models, and pushing for policies that encompass circular business growth opportunities[74]:

Recommendations for aligning economic policy measures with circular economy principles

Intervention	Desired Outcome	Sector(s) where intervention can be applied
Introduce further raw/virgin material use tax and/or tax relief for secondary raw material use	By increasing the cost of using virgin raw materials (e.g., plastic*, aggregates, textiles) and lowering the cost of using recycled materials for production (e.g. recycled plastic, paper, glass, aggregates), this intervention would achieve greater value creation for recycled products, as well as reducing the use of extracted/raw materials **A virgin plastic bag tax is already reflected in the WAPCE. The inclusion of other raw materials will enhance the outcomes of this intervention.*	● Production/ manufacturing ● Extractive industry
Introduce levies for a wider variety of single use items	This intervention would incentivise the use of re-usable items and also discourage the purchase of single use items*. The generated revenue from the levy could be used as funding for other circular economy initiatives and training programmes. **This is already applied to some plastics under the SUP directive, and also cups under the WAPCE, however further expansion could see other items like glass and other disposable products across various sectors.*	● Production/ manufacturing ● Consumer goods ● Whole of government ● Waste management

73 *The Ex'Tax Project*

74 *ACCA*

Intervention	Desired Outcome	Sector(s) where intervention can be applied
Introduce a VAT relief programme for reuse, repairs, the sharing economy, and other circular economy activities and business models	By lowering the cost of reusing and repairing for specific consumer goods, product waste and production levels will decrease. This intervention will also boost employment in the repair/maintenance sector. This intervention could prove highly beneficial on a local scale, particularly when including additional factors, such as the sharing economy and other circular economy activities and business models.	• Repair/maintenance • Consumer goods
Enhanced graded tax regime for end-of-life management	By enhancing the varied tax rate that is dependent on the treatment type, this will further incentivise application of the waste hierarchy. This could be enhanced through higher rates of tax for different treatment types.	• Waste management • Repair/maintenance
Tax benefits, innovation credits and grants	These financial interventions would increase the level of support for research pilot schemes and also for innovation demonstration projects on circular economy solutions. Research and innovation pilot projects should be conducted separately as different organisations lead on these.	• Whole of government • Cross-sectoral
Identify and phase out subsidies that favour the linear economy	Through an analysis of the current subsidy schemes that act as a barrier to circularity and discourage using secondary materials, recycling, and repairing, this intervention would see increased financial pressure to facilitate circular practices and discourage the linear economy.	• Whole of government • Cross-sectoral

3.4 FOCUS AREA 4: INVESTING IN THE CIRCULAR ECONOMY

As Ireland transitions to a circular economy, targeted government investments are necessary to support:

- infrastructure, product and service innovation, food system enhancement, business model adaptations and various technology solutions;
- capacity building for skills and knowledge across various sectors for those in existing employment is key for ensuring circular capabilities are present where they are needed most, such as construction, agriculture, and R&D, and;
- job creation where significant circular skills are lacking, such as repair/maintenance, technology solutions, and design/production[75].
- Research.

Interventions from government to support innovative companies and their new product designs could include tax benefits, innovation credits and also grants. Such financial tools have been implemented in countries around Europe, such as the Netherlands, where innovation is supported through investment

75 *Ellen MacArthur – universal circular economy policy goals*

in top sectors, such as agri-food, water, chemicals, high-tech, and creative industries. This is achieved through several campaigns and initiatives, such as the Innovation Expo[76], described below.

3.4.1 INNOVATION EXPO

The ambition of the Innovation Expo is to take breakthrough innovations further to address social challenges on a national and global scale. This is a biannual event in Amsterdam, Netherlands which focuses on varying challenges facing society today. In 2016, the expo was tackling circular economy issues[77]. The most recent circular economy related output was a movement to use the Netherlands as a circular hotspot, acting as a 'living lab' for circular activities that the rest of the world could learn from. Some elements of the hotspot included shortening supply chains through introducing small production units in cities, addressing food, energy and water issues. Other key achievements from the expo include the signing of five additional green deals between government and non-governmental organisations, businesses and research groups. These deals included the use of 'green roofs' to stimulate biodiversity and heat regulation[78].

In terms of funding, the Netherlands has implemented an 'Innovation Future Fund' which is available to innovative SMEs and vital research for the future. The fund is derived from the European Commission from the European Emissions Trading System's income (ETS) and is managed in the Netherlands by the Netherlands Enterprise Agency[79]. From 2018, the funding available was €5 million annually[80].

In the Irish context, the Circular Economy Innovation Grant Scheme (CEIGS) was developed to support social enterprises, NGOs and SMEs that are advocating change in the circular economy arena. In 2021, a total of €490,000 was allocated to 10 companies across multiple sectors including textiles, plastics, and construction[81]. The success of this fund was highlighted by several members of Circuleire and other circular-enabling organisations. An example of one of the successful companies of the 2021 fund is the Irish Green Building Council (IGBC), which is a non-profit organisation with a network of organisations and businesses from the entire value chain of the built environment[82]. IGBC are currently piloting the CMEx (Construction Materials Exchange) project which aims to demonstrate a feasible, transparent, fair, user-friendly system for the reuse of construction materials that would otherwise enter the waste stream[83].

Funding for education and skills programmes will be an integral part of the transition to a circular economy. Knowledge institutions and universities have the capacity to carry out vital research and provide education/training for circular economy activities across a wide range of disciplines, creating a cross-sectoral knowledge of good practice within the workforce. Adapting the curriculum already in place in these institutions to include more circular concepts will equip future generations with the knowledge and skills that future industries will require, and also create a society that is more informed and aware of circular practices. An example of a social enterprise which is addressing the knowledge/skills gap is the Rediscovery Centre's 'Circular Economy Academy'. This initiative supports across Ireland to maximise material use and prevent waste production. this is achieved through start-up advice on

76 *Government of the Netherlands*

77 *Dutch Water Sector*

78 *Dutch water sector*

79 *Netherland Enterprise Agency*

80 *Government of the Netherlands*

81 *Gov.ie – CEIGS*

82 *IGBC*

83 *CMEx*

circular business planning, funding, diversification, and training[84]. Some social enterprises that have been involved in the initiative to date include a mobile refilling company[85] and a bike and paint reuse company[86].

At a European and national level, there many funding initiatives that aim to support circular innovation, research, business strategy, technologies, and upskilling among others. A non-exhaustive list of these funds is provided in the table below:

Fund	Context	Examples
LIFE programme	EU fund dedicated to environmental projects, with a total of €5.4 billion awarded to date. This fund can help the transition towards a resource efficient and circular economy, while also meeting climate objectives	• *Circular economy and quality of life sub-programme*: This fund is to contribute to the shift to a circular, energy-efficient, renewable energy based- and climate resilient economy. Applications for the *first round of funding (2021-2027)* are now open.
Horizon Europe	This European fund aims to support research and initiatives to improve competitiveness across Europe, including projects on circular economy.	• *Cluster 6: Food, bioeconomy, natural resources, agriculture and environment*: aims to accelerate the transition towards the sustainable management of natural resources. It includes measures for: climate neutrality of primary production, circular management of resources, sustainable and healthy food systems, halt of biodiversity decline, and prevention and removal of pollution. • *Horizon Europe Work programme 2021-2022*.
Disruptive Technologies Innovation Fund	This Irish programme funds circular activities by inspiring the creation of market-challenging technologies	• *Cooperative Energy Trading System (CENTS)*: A disruptive technology platform for the electricity sector where consumers and communities will be empowered with the necessary infrastructure to generate their own electricity, earn from the excess electricity generation, and finally, to be an integral part of decarbonizing their homes and communities for sustainable living.
Just Transition Fund	Aimed at upskilling the workforce in the midlands region of Ireland, this fund aids circular economy by promoting sustainable practices.	• *Revamp Longford Circular Economy Project*: In 2003, the project expanded and now strives to promote the re-use of unwanted high-quality low-cost household furniture to people living in Co Longford and the surrounding environs. The project combines environmental, social and economic factors, by recycling unwanted household furniture.
Green Start and Green Plus	Both Enterprise Ireland funding programmes, these are aimed at larger and SMEs that are exploring more sustainable business practices.	• No information available on awarded companies

84 *Rediscovery centre circular economy academy*

85 *Mobile Refillery*

86 *Cyclesense*

Fund	Context	Examples
Circuléire Innovation Fund	€1.5m ring-fenced innovation fund (2020-2022) which seeks to support industry-led circular economy innovation demonstration projects which will accelerate the transition towards a circular economy in Ireland.	• *2 awarded projects in 2020:* • **Skillset for a circular economy:** Supports the White Goods Sector to develop training programmes and engage more repair engineers in life extension of appliances and therefore waste prevention with a circular economy and e-waste management ethos. • **LLLB Centre for excellence:** Tackles the challenge posed by waste long life lithium batteries (LLLB), such as those used in electric vehicles in Ireland, and will explore opportunities to manage these in a more circular and sustainable way, including repurposing and reuse of LLLBs in other industrial settings.
SFI plastics and food challenges	Competitions focus on sustainable solutions in the area of food waste and plastics in the circular economy Prize Fund: €2M each as part of the SFI Future Innovator Prize	• *Plastics Challenge: Remove, Replace, Recover*: Seeks innovative STEM-led solutions that will enable the sustainable use of plastics in a circular economy; that will restore and preserve the oceans' health; and that will maximise how the Earth's finite resources are used. It is proposed to incentivise outcomes in three specific areas: Remove, Replace and Recover. • *Food Challenge*: Supports interdisciplinary teams to develop disruptive solutions that address food loss and waste across the full breadth of the food supply chain.
EPA Green Enterprise funding	Innovation for a Circular Economy is an annual funding call to support innovators in Ireland to develop, demonstrate and implement circular economy approaches in their business models. It is managed through the EPA's Circular Economy Implementation Programme and is co-funded by EPA Research. 2022 call value €650K	• *Polymer Alloy Technology Teo*: PALTECH is a polymer engineering company with the mission of transforming waste plastics into high value products. The technology plays a critical role in the infrastructure of a circular polymer economy and delivers reduced waste, pollution and carbon emissions. • *Developing a Circular Textiles System for Ireland:* Delivering a controlled pilot programme comparing different textile collection systems, supported by a communications campaign.
The Circular Economy Innovation Grant Scheme (CEIGS)	The Circular Economy Innovation Grant Scheme (CEIGS) is a Government of Ireland initiative led by the Department of the Environment, Climate and Communications (DECC). 2022 call value: €650K	• Projects funded under the 2021 call include: • *AM Acoustic Materials Ireland*: Offer affordable solutions to noise control issues which are not only recyclable, but also provide an outstanding performance. • *Thriftify Technologies Ltd*

Fund	Context	Examples
Rural Innovation and Development Fund	Led by the Department of Agriculture, Food and the Marine, this provides funding for organisations and economic operators involved in Food Waste Reduction to promote reducing food waste generated by food businesses, retailer/wholesalers or suppliers in rural areas. 2020 call value: €300K	Projects funded under the 2020 call: ● Clean Technology Centre, Munster Technological University to develop an online training programme to tackle food waste in businesses. ● FoodCloud to investigate the potential for increasing surplus food redistribution from the Irish horticulture sector. ● FoodieSave to develop and expand an app to allow commercial businesses to sell unsold surplus products. ● Carlow County Council to deliver 'Optimization+' which brings together supports for SMEs in food, drink and hospitality sectors to develop circular economy models for their treatment of food.

Rethink Ireland (formerly Social Innovation Fund Ireland) supports innovative non-profit organisations working in communities across Ireland. As well as Green Transition funding, there are other funds e.g. social enterprise, which support projects developing and implementing circular economy activities.

Implementing a system where EU and national funding is directed at specific sectors where innovative circular solutions would be most impactful would achieve a greater number of pilot projects that could be scaled up over time. There would also be merit in a co-ordinated approach to funding at national level, which could be addressed through the Whole of Government Circular Economy Strategy.

Recommendations for investing in the circular economy

Intervention	Desired Outcome	Sector(s) where intervention can be applied
Third-level curriculum additions & enhanced apprenticeships for Circular Economy	Adapting the current curriculum at third-level knowledge institutions and universities will equip future generations with the circular knowledge that future business demands will require, and also create a society that is more informed and aware of circular practices. This could be achieved through increasing the number of environmental-related courses, and also the number of elective modules available to students that address circular economy issues. This will require both embedding circularity into existing curricula (e.g. engineering, architecture, design) and creating dedicated courses/degrees on the circular economy. Progress could be measured by assessing the number of graduates that have been educated in circular economy practices, either through environmental courses or elective modules. Apprenticeships, similar to those already in existence on repairing, could be enhanced through further investment to cover a wider suite of products/materials for repair to keep items in the value chain.	• Education sector • State agencies • Local authorities • Community groups
Enhanced innovation funding programmes	Similar to the funding programmes already in place for SMEs and multinationals, targeted circular economy innovation funds in specific sectors where impacts would be most effective (e.g., construction, textiles) would achieve a number of pilot projects/solutions that could be scaled up over time.	• Whole of government • Cross-sectoral • State agencies
Review of existing CE funding models is undertaken to identify gaps and overlaps	By conducting a review of the existing funding models that seek to enable a circular economy, a more coherent and impactful approach will be achieved where funding is strategically directed at innovative research and projects and a co-ordinated approach is taken, with clear roles & responsibilities for provision of funding for particular sectors. This intervention will seek to ensure that there are specific funds for different types of activities that deliver CE for various groups (e.g., NGOs, SMEs, manufacturers, entrepreneurs etc.), and to ensure that this funding will be managed by appropriate bodies with expertise in each of the relevant areas. Examples of this intervention in practice would include research and innovation/demonstration funding activities.	• Whole of government • Cross sectoral • State funding bodies

Intervention	Desired Outcome	Sector(s) where intervention can be applied
Implement 'green deals' between government and non-governmental organisations, businesses and research groups	Similar to the success in the Netherlands with 235 Green Deals*, Ireland would develop a number of initiatives that favour sustainable and circular activities within different sectors through strategic partnerships. Examples of target areas could be textiles, shipping, and plastics. This could be extended to local authorities, given the EPA's work with local authorities through the LAPN. **A signed Green Deal is a mutual agreement or covenant under private law between a coalition of companies, civil society organizations and local and regional government. The deal defines the initiative, the actions and the input by participants as clearly as possible. The deals last on average about 2 to 3 years. A deal ends when all agreements are fulfilled, and the goals are achieved.*	● Whole of government ● Cross-sectoral ● Multiple stakeholders

3.5 FOCUS AREA 5: COLLABORATE

A successful transition to a circular economy requires a system thinking approach. Government and policymakers need to ensure collaboration not only across government departments but also with multiple actors across the public and private sector as well as independent not for profit groups and social enterprises. Local, national, EU and international experience and knowledge must be harnessed.

3.5.1 CROSS-GOVERNMENT APPROACH & INTERNATIONAL POLICY ALIGNMENT

In Ireland, traditionally the environment and natural resource related government departments have been responsible for policies pertaining to climate action and with that, the circular economy. For the shift to be made to a circular economic model, however, all government departments have a role to play. At the core of a circular economy is the need for interconnectivity, between systems and players within those systems. Thus, for this systemic change to take place, this concept of interconnectivity needs to be introduced in government. In practice this means the promotion and execution of circular economy principles across all government departments through a cross-governmental approach to the circular economy. For this to be realised it is recommended that that the Dept of Taoiseach take the lead in coordinating this approach, similar to in the Climate Action Plan.

Through implementing a cross-governmental and inter-departmental approach, circular economy principles can be mainstreamed across policymakers This mainstreaming creates greater alignment between sectors and ultimately will increase network support and the availability of valuable materials. This approach is being applied in the Whole of Government Circular Economy Strategy (WGCES) with a cross departmental group set up to support its implementation. Departments which will benefit greatly from collaboration are the Circular Economy (DECC) and the Bioeconomy (DAFM) departments, as both have common goals and thus the streamlining of resources and knowledge would prove advantageous. Similarly, through this approach there is the possibility, not only, of shared material resource but also financial resources between sectors for the uptake of a circular economy. Ultimately, greater alignment within government allows for harmonisation of the messages being sent to industry and consumers regarding the circular economy. In practice this involves aligning policy strategies with a sectoral focus (such as plastics, textiles, electronics, the built environment, food and agriculture, and broader industrial policy) with cross-departmental policy measures (such as public procurement) or cross

governmental policy measures (such as spatial planning policies). To facilitate this coordination, central government leadership can provide overarching direction that is essential to achieving the transition to a circular economy. This overarching direction has already been undertaken in Ireland in the form of the Whole of Government Circular Economy Strategy. This is an important step in the right direction and gives crucial top-down guidance. The challenge now is the integration of this strategy across governmental departments and ensuring everyone plays their part and certain departments (such as the environmental) do not bear the load.

Material flows and value chains are not often confined within our own country borders. Efforts to harmonise alignment of European and international policy and regulation are vital to enable an effective transition to a circular economy. Government needs to actively engage with cross-border policymakers as to ensure alignment and promote resource efficiency. For example, international standardisation of resource classification, such as the product labels discussed in Focus area 1 above would support valuable resources staying within the value chain. Similarly, harmonisation across various collection and EPR schemes would help to reduce transaction costs and improve the effectiveness of these interventions.

In pursuit of cross-border stakeholder engagement, Government can participate and/or facilitate the use of forums and information exchanges both within and/or outside of institutional settings. Such initiatives can contribute to identifying potential alignment opportunities and policy barriers that can then be addressed. These exchange systems can be on a regional, national and international level. An example of this is the European Circular Economy Stakeholder Platform which serves as a space for the exchange of ideas and a body of information as to accelerate the transition to a circular economy. The EPA and DECC are already members of many European wide platforms and stakeholder groups (such as EIONET) and should therefore leverage these relationships in pursuit of circular economy policy alignment.

3.5.2 MULTI-STAKEHOLDER COLLABORATION & SECTORAL ROADMAPS

Multi-stakeholder collaboration allows for the development of both feasible and non-impeding circular economy policies. It is particularly beneficial for a sectoral approach to be applied to stakeholder collaboration so as to strengthen understanding of the opportunities and barriers on all sides and create a greater sense of shared ownership and participation in the transition. Ireland is particularly active in terms of stakeholder collaboration, with multiple working groups across multiple sectors. These stakeholder working groups, however, lack an overarching governance structure and subsequently few quality actions are produced from such groups. Thus, for Ireland to take advantage of its already established stakeholder collaboration groups, clear structure needs to be put in place.

Data and digitally enabled solutions can facilitate business-to-business (B2B) and business-to-consumer (B2C) partnerships for improved waste-to-resource matching[87]. Understanding opportunities for reverse logistics, industrial symbiosis or remanufacturing across value chains requires knowledge on product condition as well as the existing market situation, which can be facilitated by digital solutions[88]. This matchmaking function helps companies to source high-value reuse options for materials and or products - which can be powered by AI, blockchain and smart contracts[89] and individuals to source excess products to avoid waste generation.

Ireland's Whole of Government Circular Economy Strategy highlights the needs to develop circular economy sectoral roadmaps for the construction, transport, agri-food, consumer goods and procurement

87 *https://www.sciencedirect.com/science/article/pii/S0148296320304987*

88 *https://ellenmacarthurfoundation.org/artificial-intelligence-and-the-circular-economy*

89 *https://www.sitra.fi/en/publications/the-winning-recipe-for-a-circular-economy/*

sectors. When actioning this, government should leverage stakeholder collaboration (including the public sector, private sector, NGOs, academia, citizens, and labour unions etc.). Through stakeholder collaboration a clear and actionable vision for a circular economy in Ireland can be developed.

3.5.3 REGULATORY SANDBOX MECHANISM

To overcome regulatory barriers, policymakers can facilitate a two-way feedback loop between themselves and business and research communities, known as a regulatory sandbox. A regulatory sandbox is a legal classification that creates a space where participating businesses will not be subject to onerous regulations – usually for a limited amount of time. The point of this mechanism is to allow these businesses to 'play' in the sandbox without regulations to see if innovative ideas and products can get traction and enter the market. This mechanism will allow for multiple stakeholder perspectives on how policies are affecting the uptake of circular economy principles to be brought forward, in turn allowing for policy makers to make regulatory adjustments where applicable. An example of where governments have supported the uptake of this mechanism is in Greece where a new competition law sustainability 'sandbox' has been advocated for. Similarly, the Green Deal approach in the Netherlands, which brought policymakers, companies, and NGOs together is a great example of a successful implementation of a regulatory sandbox:

Case Study – Netherlands Green Deal[90]

The government in the Netherlands has addressed non-financial barriers to the uptake of the circular economy with a whole new programme, the Green Deal. The programme is a joint initiative of the Ministers of Economic Affairs, Infrastructure and the Environment and the Interior and Kingdom Relations, with a board comprised of business, NGOs, and government. Through this programme, the government has taken a new role of providing a responsive service to organisations that ask for help to realise green growth. The applicant organisation, which can be a company, industry organisation or NGO, outlines their business idea, the barriers that stand in its way and potential solutions to them. If successful, the government signs a voluntary agreement with the initiating organisation to work with them for two to three years. The government provides support to Green Deals by undertaking actions on the four Green Growth pillars: laws and regulations, market incentives, innovation and networking. This initiative therefore not only stimulates green economic growth but creates a feedback loop between government and industry, allowing for barriers to the uptake of circular economy business models to be addressed.

90 *Netherland Green Deal*

3.5.4 INDUSTRIAL SYMBIOSIS

Industrial symbiosis (IS) is a powerful concept to support the transition to a circular economy in Ireland and can be defined as *"the use by one company or sector of underutilised resources broadly defined (including waste, by-products, residues, energy, waste, logistics, capacity, expertise, equipment and materials) from another, with the result of keeping resources in productive use for longer."*[91]

Government and policymakers need to initiate, facilitate, and coordinate IS networks. To do this, government will need to motivate more resource exchanges between companies through policy and/or financial instruments, act as a knowledge broker and provide platforms for joint data and information sharing, foster the uptake of IS services through advertisement campaigns, set up common objectives for delivery on IS services and develop policy that specifies local, regional, and national IS regulations[92].

Case Study – Symbiobeer[93]

SymbioBeer is an industrial symbiosis demonstration pilot, funded under EPA Green Enterprise, and facilitated by Irish Manufacturing Research (IMR). The industrial symbiosis was between St. Mel's Independent Brewing Company and Panelto Foods between 2020 – 2021. During the project, both partners explored the use of different residues as substitutes for a proportion of their key ingredients. St Mel's Brewery developed a new recipe that replaced 15% of malt with surplus bread from Panelto Foods, whilst Panelto Foods experimented with BSG (a by-product from St Mel's) as a new high nutritional value ingredient for their bread. The results indicated that if valorisation of cooked dough as a malted grain substitute was rolled out across St Mel's portfolio of beers, it could deliver a potential annual reduction of 3% CO_2 emissions. This reduction is attributed to the use of lower amounts of virgin materials with approximately 15 tons of virgin ingredients saved per year.

3.5.5 AWARENESS RAISING

Governments can support the development of public trust, and in turn the uptake of a circular economy, through awareness raising campaigns. By stimulating public participation, awareness campaigns can address the behavioural barrier facing the transition to a circular economy. It is important that awareness campaigns emphasise the top of the waste hierarchy, re-use and repair. Consumer behaviour to date is largely focused on recycling which is less impactful than re-use and repair. Awareness campaigns therefore need to start from the beginning and educate both citizens and industry on the core principles of a circular economy and from that, the necessity for re-use and repair practices. The WGCES proposes a national circular economy platform to address this and bring about consistent communications. Examples of what could be included in such a platform is the sharing of information about the location of collection points and the availability of spare parts for repair, showing how to separate materials to ensure collections are unspoilt and increasing the uptake of EPR and DRS schemes[94]. Although consumer behaviour is important in the transition to a circular economy, there also needs to be awareness campaigns directed towards business, manufacturing, extraction and construction sectors where impact is highest.

91 *Industrial Symbiosis: Guide for Policy Makers*

92 *Sodergren (2021)*

93 *Symbiobeer*

94 *Ellen MacArthur Foundation: Universal Circular Economy Policy Goals*

Case Study – EU Commission SME support[95]

The hurdles faced by SMEs to adopt circular economy practices significantly limit the speed at which the European economy can transition towards a circular economy, since SMEs represent 99% of all businesses in the EU. With this project the Commission aimed to pilot which route to bring assets (e.g. knowledge, networks and tools) to SMEs to address these hurdles. As part of this project the EU Commission supported 330,000 SMEs, representing 1.5% of all SMEs in the EU, across 20 EU member states, to adopt circular economy strategy and practices. The project provided trainings from experts in the field of circular economy to SME support organizations. SME support organization have set-up support programmes that offer services to inform SMEs about the business benefits of adopting. To be able to fulfil their role as facilitators, SME support organisations need to gain and improve their capacity to extend their scope of service provisions offered to SMEs. Thus, as part of this project, the commissions helped 27 SME support organizations across Europe to develop that capacity. The support was well received by participants as they valued the practical nature of the trainings and the opportunity to be able to speak with experts with hands-on experience.

This is especially applicable in Ireland where SMEs account for most employment in manufacturing and services. SMEs account for as much as 56% of manufacturing employment and 74% of services employment and thus SME circular support mechanisms would greatly aid the uptake of the circular economy in these sectors in Ireland[96].

Recommendations for enablers

Intervention	Desired Outcome	Sector(s) where intervention can be applied
Integrate circular economy policy across government departments	Applying a cross-government approach to the circular economy allows for enhanced alignment and resource efficiency. This will require cooperation and coordination across departments and increased knowledge sharing which can be achieved through activation of the inter-departmental Circular Economy Working Group	• Whole of government • Cross-sectoral
Develop sectoral circular economy roadmaps	Engage with multiple stakeholders across priority sectors to develop well informed sector specific circular economy roadmaps	• Priority sectors (construction, textiles, plastics & packaging, agri-food)
Government bodies to set up circular action plans	Government should mandate that all government bodies draw up and implement circular action plans, building on existing Resource Efficiency Action Plans that are required across government departments;	• Whole of government
Enhance regional and local coordination	Enhance coordination between regional and local offices, for instance between RWMPOs, Climate Action Regional Offices (CAROs), local authorities and Local Enterprise Office (LEO) staff to further enhance alignment and resource efficiency.	• Regional and Local offices

95 *EU Commission SME Support*

96 *OECD Circular Economy Report*

Intervention	Desired Outcome	Sector(s) where intervention can be applied
Map and identify main stakeholders to engage with	In support of the development of sectoral circular economy roadmaps, the most impactful stakeholders for each sector need to be identified as to bring clear structure and effective communication	• Whole of government • Cross-sectoral
Act as a knowledge share broker	To ensure consistent communication as well as opportunities for knowledge and data sharing, the government should set up a national CE platform.	• Whole of government • Multiple stakeholders • Cross-sectoral
Assist in the monitoring and reporting of Eurostat circular economy indicators	By bringing these metrics to the forefront at a national level and enhancing the monitoring and reporting of the various indicators, there would be an increased opportunity to identify areas for improvement within the circular economy. From this data, circular economy targets can be set and progress against these further monitored.	• Whole of government • Cross-sectoral
Industrial Symbiosis Facilitation	Government can facilitate the uptake of IS services through motivating more resource exchanges between companies, penalising lower hierarchy waste management options and providing information and facilitation assistance for companies to identify economically viable alternatives for their waste	• Whole of government • Cross-sectoral • Industry bodies
Support Regulatory Sandbox Mechanisms	Facilitate two-way feedback loops, through financial support and coordination of multiple stakeholders, to address regulatory barriers to the uptake of a circular economy. This could also involve the formation of a task force to action the issues raised and ultimately seek to amend legislation identified as a barrier.	• Multiple stakeholders (industry, NGOs, policymakers, research communities etc.) • Cross-sectoral
Awareness raising campaigns	By providing a range of different awareness raising campaigns across all sectors, government can increase public trust and participation in the circular economy. Coordination of any awareness campaign would need to take account of and be aligned with existing communications campaigns. It would also be important that such a campaign includes metrics to measure effectiveness to ensure value for money.	• Cross-sectoral • Consumers & Industry

4. Conclusions

Legal and financial government interventions have been widely implemented across the EU to accelerate the transition to a circular economy. Circularity is becoming an integral part of the global agenda, which is reflected through the increasing number of policies and strategies at both a European and national level. As Ireland moves into the next stages of actioning the Whole of Government Circular Economy Strategy this paper provides several examples of successful interventions implemented elsewhere that could be adopted to catalyse the shift to circularity. As demonstrated in this report, there are five key areas of opportunity in which Government interventions can successfully optimise this transition;

1. Keeping products in the loop through incentivising re-use, repair, recycling, and eco-design of products;

2. Closing the loop by having effective legislation and authorisations for Extended Producer Responsibility models and Deposit Return Schemes, as well as conducting Green Public Procurement in a way that re-use and repair are incorporated into GPP criteria and end-of-life of products being procured is pre-considered;

3. Aligning economic policy measures with Circular Economy principles to ensure circularity is incentivised at all stages, from extraction of raw materials and along the product life cycle, while also aligning with other economic enablers, such as labour tax;

4. Investing in the Circular Economy by building on existing funding models that enable circular activities and focusing on circular investments for infrastructure, capacity building, and skill force; and

5. Collaboration across government, priority sectors, business, social enterprise, researchers, innovators, international institutions and enablers, and society as a whole.

APPENDIX A

POLICY AND LEGISLATIVE CONTEXT

The ambition to transition to a circular economy is underpinned by international, European, national and regional legislation and policy and **act as a fundamental driver for the transition to a more circular economy.** We have provided a high-level summary of the key, most pertinent policy and legislative context below.

Global

At an international level, there is a drive towards the achievement of deep decarbonisation and wider sustainable development. The Paris Agreement, COP26 outcomes and the UN Sustainable Development Goals (UN SDGs) are the key overarching instruments to deliver effective and sustainable change. The circular economy is and can form an integral part of achieving the ambitious targets and actions underlying these agreements and pledges.

EU

At an EU level, there are several legislative tools and policies that seek to drive a more circular economy. The EU Green Deal[97] is the overarching framework for the EU to meet the Paris Agreement target and achieve wider sustainable development. The Green Deal aims to achieve a "fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net GHG emissions in 2050 and where economic **growth** is decoupled from resource use" – these objectives are synonymous with the aims of a circular economy.

The Circular Economy Action Plan **(CEAP)**[98] adopted in 2020 (planned adoption date for several initiatives under the action plan is 2021-2022) is one of the main building blocks of the EU Green Deal. Its aim is to reduce the EU's consumption footprint and double the circular material use rate in the next decade, whilst boosting economic growth and harnessing the potential of innovation and digitisation.

In addition, the EU Taxonomy Regulation[99], adopted in 2020, will play an important role in scaling up investment in and financing of 'environmentally sustainable' economic activities which support specific environmental objectives, including the transition to a circular economy. This Regulation means that businesses will have to ultimately show how their products or activities meet defined criteria, such as use of recycled materials and changing the business model to embrace and incentivise longevity and resilience of products.

97 *European Green Deal*

98 *Circular Economy Action Plan*

99 *Sustainable Finance Taxonomy*

National

At a national level, the Irish government recognises the importance of the circular economy in achieving its climate ambitions of a 51% reduction in GHG emissions by 2030 and net zero by 2050[100]. Ireland has strengthened its approach to driving a circular economy with recent policy and legislative activity:

- The Climate Action Plan 2021 aims to meet's climate ambitions, and create a cleaner, greener economy and society. It is an opportunity to create new jobs and grow businesses in areas like offshore wind; cutting-edge agriculture; and retrofitting.
- The Waste Action Plan for a Circular Economy 2020 - 2025 (WAPCE) is Ireland's transition away from the narrow consideration of waste treatment, with an objective to focus on the broader opportunities of a circular economy. The plan addresses consumption, product design, waste generation and product life extension and the activities listed below flow from this national waste policy.
- The Whole of Government Circular Economy Strategy (WGCES)[101] is Ireland's first national strategy providing a policy framework for the transition to a circular economy, with an aim to eliminate the barriers of the circular economy transition in Ireland and close the gap between policy and action;
- The Circular Economy Act 2022[102] places the Circular Economy Strategy, and Ireland's commitment to a circular economy, on a clear statutory footing and provide the necessary underpinning for relevant measures. The Act defines the Circular Economy for the first time in Irish domestic law. It incentivises the use of reusable and recyclable alternatives to a range of wasteful single-use disposable packaging and other items. It introduces mandatory segregation of commercial waste, bringing it in line with the household market to support increased recycling rates. integrates the WGCES and Ireland's commitment to the transition to the circular economy into Irish law.
- The EPA-led Circular Economy Programme 2021-2027[103], is driving Ireland's move to a circular economy and the programme supports the whole of government Circular Economy Strategy. This national programme incorporates the National Waste Prevention Programme and has a statutory basis under the Circular Economy Act. The EPA's Circular Economy Programme is a driving force for Ireland's move to a circular economy. It supports national-level, strategic programmes to prevent waste and drive the circular economy in Ireland. The vision for the programme is an Ireland where the circular economy ensures that everyone uses less resources and prevents waste to achieve sustainable economic growth.
- The National Waste Management Plan (currently in development by the RWMPOs) will be a National Waste Management Plan for a Circular Economy.

100 *Climate Action Plan 2021*

101 *Whole of Government Circular Economy Strategy*

102 Available at: *https://www.gov.ie/en/press-release/4546a-landmark-circular-economy-act-signed-into-law/*

103 Available at: *https://www.epa.ie/publications/circular-economy/resources/EPA_Circular_Economy_2021_Programme_Apr22_Web.pdf*

APPENDIX B

STAKEHOLDER ENGAGEMENT

Thirteen stakeholders were engaged with (12 via interview, 4 via survey) as indicated in the table below. The purpose of these stakeholder interviews and surveys was to gather further insights, beyond what was collated as part of the **targeted desk-based review.**

Stakeholder	Sector	Interview	Survey recipient
Ellen MacArthur Foundation	Charity / Think-tank	Y	N
Circle Economy	Not-for-profit organisation	Y	N
Circuléire	Public-private partnership – circular manufacturing platform	Y	Y
Ibec	Lobby & Business representative group	Y	Y
Department of the Environment, Climate & Communications (DECC)	Government department	Y	N
Irish Green Building Council	Not-for-profit organisation	Y	N
European Environment Agency	EU agency	Y	N
Regional Waste Management Planning Office	Local Government	Y	N
Community Resources Network Ireland	Social Enterprise	Y	Y
Rediscovery Centre	Social Enterprise	Y	N
Enterprise Ireland	Government agency	Y	N
IDA Ireland	Statutory agency	Y	N
Ballymore Group	Property Developer	N	Y

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Author	Title	Date	Link
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McKinsey & Co.	Europe's circular-economy opportunity	2015	*Europes circulareconomy opportunity.ashx (mckinsey.com)*
UNCC	The Paris Agreement	2022	*The Paris Agreement | UNFCCC*
European Commission	A European Green Deal	2022	*A European Green Deal | European Commission (europa.eu)*
European Commission	Circular economy action plan	2020	*Circular economy action plan (europa.eu)*
European Commission	Sustainable finance taxonomy - Regulation (EU) 2020/852	2020	*Sustainable finance taxonomy - Regulation (EU) 2020/852 | European Commission (europa.eu)*
Gov.ie	Climate Action Plan 2021	2021	*gov.ie - Climate Action Plan 2021 (www.gov.ie)*
Gov.ie	Whole of Government Circular Economy Strategy 2022 – 2023 'Living More, Using Less'	2021	*gov.ie - Whole of Government Circular Economy Strategy 2022 – 2023 'Living More, Using Less' (www.gov.ie)*
Gov.ie	General Scheme of the Circular Economy Bill 2021	2021	*gov.ie - General Scheme of the Circular Economy Bill 2021 (www.gov.ie)*
EPA	The Circular Economy Programme 2021-2027	2021	*Resources | Environmental Protection Agency (epa.ie)*
Gov.ie	Green Public Procurement (GPP)	2021	*gov.ie - Green Public Procurement (GPP) (www.gov.ie)*
Gov.ie	Waste Action Plan for a Circular Economy	2020	*gov.ie - Waste Action Plan for a Circular Economy (www.gov.ie)*
Gov.ie	Circular 20/2019: Promoting the use of Environmental and Social Considerations in Public Procurement	2019	*gov.ie - Circular 20/2019 : Promoting the use of Environmental and Social Considerations in Public Procurement (www.gov.ie)*
EPA	Green Public Procurement	2021	*Resources | Environmental Protection Agency (epa.ie)*
Van Houten & Ishii	The world needs a circular economy. Help us make it happen	2020	*The world needs a circular economy. Let's make it happen | World Economic Forum (weforum.org)*

Author	Title	Date	Link
WBCSD	Circular Transition Indicators (CTI)	2022	*Circular transition indicators - World Business Council for Sustainable Development (WBCSD)*
Rizos et al.	Barriers and enablers for implementing circular economy business models	2021	*rr2021-01_barriers-and-enablers-for-implementing-circular-economy-business-models.pdf (europa.eu)*
White Paper	Breaking the Barriers of a Circular Economy	2017	*171106_white_paper_breaking_the_barriers_to_the_circular_economy_white_paper_vweb-14021.pdf (europa.eu)*
Turunen et al.	Well Defined Is Half Solved? The Regulatory Barriers for Circular Economy Business	2021	*NMT2021nr1_ 6_Turunen_mfl.pdf (nordiskmiljoratt.se)*
Tura et al.	Unlocking circular business: A framework of barriers and drivers	2019	*Unlocking circular business: A framework of barriers and drivers - ScienceDirect*
R2piProject	Enablers and Barriers to a Circular Economy	2018	*R2pi-stakeholders-report-sept-2018.pdf (r2piproject.eu)*
Environment Journal	'Generation Green': how millennials will shape the circular economy	2018	*'Generation Green' : how millennials will shape the circular economy - EnvironmentJournal*
Melati et al.	Barriers and drivers for enterprises to transition to circular economy	2021	*barriers-drivers-enterprises-circular-economy-sei-brief.pdf (jstor.org)*
Ellen MacArthur Foundation	Universal circular economy policy goals	2021	*Universal circular economy policy goals: Enabling the transition to scale (ellenmacarthurfoundation.org)*
Innovation Origins	France leads the way with a "Repair index" for electronic products	2020	*France moves ahead with a "repair index" for electronic products (innovationorigins.com)*
RepairEU	One year on, has the French repair index kept its promises?	2022	*https://repair.eu/news/one-year-on-has-the-french-repair-index-kept-its-promises/*
Durability Matters	Built To Fail: 7 Examples Of Planned Obsolescence	2021	*https://durabilitymatters.com/planned-obsolescence/*
The Ecologist	Planned obsolescence of planned obsolescence	2021	*Planned obsolescence of planned obsolescence (theecologist.org)*
BAMB	Materials Passports	2022	*https://www.bamb2020.eu/passports/passports-platform/*
OECD	Extended producer responsibility	2022	*https://www.oecd.org/env/tools-evaluation/extendedproducerresponsibility.htm*

Author	Title	Date	Link
Copper8	Circular Revenue Models	2019	*https://www.copper8.com/wp-content/uploads/2019/10/Circular-Revenue-Models_Guideline-Policymakers.pdf*
WEEE Ireland	What is WEEE Ireland?	2022	*Our Story - WEEE Ireland*
EUR-Lex	European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste	2018	*EUR-Lex - 31994L0062 - EN - EUR-Lex (europa.eu)*
ISB	S.I. No. 400/2017 - Waste Management (Tyres and Waste Tyres) Regulations 2017.	2017	*S.I. No. 400/2017 - Waste Management (Tyres and Waste Tyres) Regulations 2017. (irishstatutebook.ie)*
ISB	S.I. No. 341/2001 - Waste Management (Farm Plastics) Regulations, 2001	2001	*S.I. No. 341/2001 - Waste Management (Farm Plastics) Regulations, 2001 (irishstatutebook.ie)*
EUR-Lex	Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of life vehicles - Commission Statements	2020	*EUR-Lex - 32000L0053 - EN - EUR-Lex (europa.eu)*
EUR-Lex	Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC (Text with EEA relevance)	2018	*EUR-Lex - 32006L0066 - EN - EUR-Lex (europa.eu)*
Electrive	EU likely to adopt battery standards by March	2022	*EU likely to adopt battery standards by March - electrive.com*
Poikli, K.	Concretising the role of extended producer responsibility in European Union waste law and policy through the lens of the circular economy	2020	*Concretising the role of extended producer responsibility in European Union waste law and policy through the lens of the circular economy | SpringerLink*
Eunomia	What are Modulated Fees and how do they work?	2020	*What are Modulated Fees and how do they work? - Eunomia*
REPAK	What are Eco Modulated Fees and what does it mean for Businesses and their Packaging?	2021	*What are Eco Modulated Fees and what does it mean for Businesses and their Packaging? | Repak*

Author	Title	Date	Link
The Knowledge Exchange	Lessons from Norway: Deposit Return Scheme	2019	*Lessons from Norway: Deposit Return Scheme | The Knowledge Exchange Blog*
Infinitum	Recycling 24/7	2022	*Infinitum*
Kenny, A.	Ireland should include glass bottles in deposit return scheme – Danish experts	2021	*Ireland should include glass bottles in deposit return scheme – Danish experts (irishtimes.com)*
OECD	Deposit refund schemes	2022	*Deposit refund schemes - OECD Ocean*
OECD	Towards a more resource-efficient and circular economy	2021	*OECD-G20-Towards-a-more-Resource-Efficient-and-Circular-Economy.pdf*
European Commission	Green Public Procurement	2021	*Green Public Procurement - Environment - European Commission (europa.eu)*
Testa et al.	What factors influence the uptake of GPP (green public procurement) practices? New evidence from an Italian survey	2012	*What factors influence the uptake of GPP (green public procurement) practices? New evidence from an Italian survey (europa.eu)*
European Commission	GPP Good Practice	2022	*GPP Good Practice - Environment - European Commission (europa.eu)*
European Commission	City of Barcelona's + Sustainable City Council Programme	2016	*Issue61_Case_Study_124_Sustainable_City_Barcelona.pdf (europa.eu)*
PIANOo	Circular procurement	2022	*Circular procurement | PIANOo - Dutch Public Procurement Expertise Centre*
EPA	End of Waste (Art. 28)	2021	*End of Waste (Art. 28) | Environmental Protection Agency (epa.ie)*
ISB	S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011.	2011	*S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011. (irishstatutebook.ie)*
EPA	EoW Criteria for Recycled Aggregates - Panda Greenstar	2019	*Compliance & Enforcement: Waste Publications | Environmental Protection Agency (epa.ie)*
EPA	EoW Criteria for Poly(ethylene Phthalate) Recyclate - Shabra Recycling Limited	2019	*Compliance & Enforcement: Waste Publications | Environmental Protection Agency (epa.ie)*

Author	Title	Date	Link
ACCA	Tax as a force for good: rebalancing our tax systems to support a global economy fit for the future	2018	*Tax as a force for good: rebalancing our tax systems to support a global economy fit for the future | ACCA Global*
Milios, L.	Towards a Circular Economy Taxation Framework: Expectations and Challenges of Implementation	2021	*Towards a Circular Economy Taxation Framework: Expectations and Challenges of Implementation | SpringerLink*
Eurostat	Recycling – secondary material price indicator	2022	*Recycling – secondary material price indicator -Statistics Explained (europa.eu)*
EEA	Environmental taxes on aggregate materials in the EU: towards sustainable construction	2016	*Environmental taxes on aggregate materials in the EU: towards sustainable construction — European Environment Agency (europa.eu)*
IEEP	Plastic Bag Levy in Ireland	2017	*IE Plastic Bag Levy final.pdf (ieep.eu)*
CRNI	New environmental levies proposed to encourage more sustainable behaviour	2019	*New environmental levies proposed to encourage more sustainable behaviour - Community Resources Network Ireland (crni.ie)*
Europa	Study on reduced VAT applied to goods and services in the Member States of the European Union	2007	*Microsoft Word - Study on reduced VAT final report part A_updated 21-06_KHS.doc (europa.eu)*
Knowledge Hub	Swedish government tax break programme for repair	2020	*Swedish government tax break programme for repair | Knowledge Hub | Circle Lab (circle-lab.com)*
Statista	Value of landfill tax in European countries* as of 2017, by country	2022	*Landfill tax in Europe 2017 | Statista*
EEA	Managing municipal solid waste— a review of achievements in 32 European countries	2013	*Managing municipal solid waste - a review of achievements in 32 European countries — European Environment Agency (europa.eu)*
EUR-Lex	Directive 2008/98/EC of the European Parliament and of the Council	2008	*CL2008L0098EN0030020.0001_cp 1..1 (europa.eu)*
EX'TAX	The Ex'tax Project	2022	*Turning tax into a force for good | The Ex'tax Project (ex-tax.com)*
Netherlands Government	Encouraging innovation	2022	*Encouraging innovation | Enterprise and innovation | Government.nl*

Author	Title	Date	Link
Dutch Water Sector	Innovation Expo Amsterdam: Welcome home circular economy!	2016	*Innovation Expo Amsterdam: Welcome home circular economy! | Dutch Water Sector*
Netherlands Enterprise Agency	Innovation Fund	2021	*Innovation Fund | RVO.nl*
Gov.ie	€490,000 awarded to projects to promote the Circular Economy across Ireland	2021	*gov.ie - €490,000 awarded to projects to promote the Circular Economy across Ireland (www.gov.ie)*
IGBC	About	2022	*About - Irish Green Building Council (igbc.ie)*
CMEx	CMEx Project	2021	*CMEx One page Flyer (igbc.ie)*
Rediscovery Centre	Circular Economy Academy	2022	*Circular Economy Academy | Rediscovery Centre*
The Mobile Refillery	Home Website	2022	*Home | The Mobile Refillery*
Cycle Sense	Home Website	2022	*Cycle Sense*
Business Government NL	Green Deal	2022	*Green Deal | Business.gov.nl*
Baltic Industrial Symbiosis	Guide for Industrial Symbiosis Facilitators	2021	*http://www.symbiosis.dk/wp-content/uploads/2021/03/Guide-for-IS-facilitators_online2.pdf*
Sodergren & Palm	The role of local governments in overcoming barriers to industrial symbiosis	2021	*The role of local governments in overcoming barriers to industrial symbiosis - ScienceDirect*
Irish Manufacturing Research	SymbioBeer	2022	*SymbioBeer - Irish Manufacturing Research (imr.ie)*
Europa/KPMG	Accelerating towards a circular economy	2019	*024-2019 Report Boosting the circular economy among SMEs.pdf (europa.eu)*

Policy Review Documents

Title	Link
Paris Agreement	*Paris Agreement English (unfccc.int)*
UN SDGs	*THE 17 GOALS | Sustainable Development (un.org)*
European Green Deal	*resource.html (europa.eu)*
Circular Economy Action Plan	*A new Circular Economy Action Plan (europa.eu)*
Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment (SUP Directive)	*http://data.europa.eu/eli/dir/2019/904/oj*
European Industrial Strategy 2020	*communication-industrial-strategy-update-2020_en.pdf (europa.eu)*
EU Waste Framework Directive (2008/98/EC) – WFD (and 2018 amendment)	*http://data.europa.eu/eli/dir/2008/98/oj*
EU Chemicals Strategy	*Strategy.pdf (europa.eu)*
EU Plastics Strategy	*EUR-Lex - 52018DC0028 - EN - EUR-Lex (europa.eu)*
EU Farm to Fork Strategy	*EUR-Lex - 4494870 - EN - EUR-Lex (europa.eu)*
EU Zero Pollution Action Plan	*EUR-Lex - 52021DC0400 - EN - EUR-Lex (europa.eu)*
EU Packaging & Packaging Waste Directive	*EUR-Lex - 01994L0062-20150526 - EN - EUR-Lex (europa.eu)*
Batteries and accumulators and waste batteries and accumulators and repealing Directive 2006/66/EC - EU Batteries Directive	*EUR-Lex - 32006L0066 - EN - EUR-Lex (europa.eu)*
Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive	*EUR-Lex - 32011L0065 - EN - EUR-Lex (europa.eu)*
EU WEEE Directive	*EUR-Lex - 02012L0019-20180704 - EN - EUR-Lex (europa.eu)*
EU End-Of-Life Vehicles Directive	*EUR-Lex - 32000L0053 - EN - EUR-Lex (europa.eu)*
Eco-Design Directive	*EUR-Lex - 32019R2021 - EN - EUR-Lex (europa.eu)*
EU Strategy for Textiles (2022)	*Textiles strategy (europa.eu)*
EU Circular Electronics Initiative	*Carriage details | Legislative Train Schedule (europa.eu)*
EU Regulatory Framework for Sustainable Batteries	*New EU regulatory framework for batteries (europa.eu)*
EU Green Public Procurement (2017)	*CP_European_Commission_Brochure_webversion_small (europa.eu)*

Title	Link
Whole of Government Circular Economy Strategy (2022-2023)	*gov.ie - Whole of Government Circular Economy Strategy 2022 – 2023 'Living More, Using Less' (www.gov.ie)*
The Circular Economy Bill 2021	*gov.ie - General Scheme of the Circular Economy Bill 2021 (www.gov.ie)*
National Waste Prevention Programme Annual Report 2020	*NWPP-Annual-Report-2020.pdf (epa.ie)*
Waste Action Plan for a Circular Economy (2020-2025) - WAPCE	*gov.ie - Waste Action Plan for a Circular Economy (www.gov.ie)*
Climate Action and Low Carbon Development Bill 2021	*gov.ie - Climate Action and Low Carbon Development (Amendment) Bill 2021 (www.gov.ie)*
National Climate Action Plan 2021	*gov.ie - Climate Action Plan 2021 (www.gov.ie)*
DPER Circular 20/2019: Promoting the use of Environmental and Social Considerations in Public Procurement	*gov.ie - Committee of Public Accounts Reports and the corresponding Minute of the Minister for Public Expenditure and Reform (www.gov.ie)*
Our Rural Future: Rural Development Strategy 2021-2025	*gov.ie - Our Rural Future: Rural Development Policy 2021-2025 (www.gov.ie)*
Future Jobs Ireland 2019 (Circular Economy context)	*gov.ie - Future Jobs Ireland – Preparing Now for Tomorrow's Economy (www.gov.ie)*
National Waste Management Plan for a Circular Economy	*National Waste Management Plan for a Circular Economy - mywaste My Waste*
Regional Spatial & Economic Strategy (2019-2031) – Eastern & Midland Regional Assembly	*EMRA_RSES_1.4.5web.pdf*
EPA Circular Economy Programme	*EPA_Circular_Economy_2021_Programme_Apr22_Web.pdf*
Regional Spatial and Economic Strategy – Northern and Western Regional Assembly	*RSES | Northern and Western Regional Assembly (nwra.ie)*
Regional Spatial and Economic Strategy – Southern Regional Assembly	*Southern Regional Assembly (southernassembly.ie)*

AN GHNÍOMHAIREACHT UM CHAOMHNÚ COMHSHAOIL

Tá an GCC freagrach as an gcomhshaol a chosaint agus a fheabhsú, mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ar thionchar díobhálach na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialáil: *Rialáil agus córais chomhlíonta comhshaoil éifeachtacha a chur i bhfeidhm, chun dea-thorthaí comhshaoil a bhaint amach agus díriú orthu siúd nach mbíonn ag cloí leo.*

Eolas: *Sonraí, eolas agus measúnú ardchaighdeáin, spriocdhírithe agus tráthúil a chur ar fáil i leith an chomhshaoil chun bonn eolais a chur faoin gcinnteoireacht.*

Abhcóideacht: *Ag obair le daoine eile ar son timpeallachta glaine, táirgiúla agus dea-chosanta agus ar son cleachtas inbhuanaithe i dtaobh an chomhshaoil.*

I measc ár gcuid freagrachtaí tá:

Ceadúnú

- Gníomhaíochtaí tionscail, dramhaíola agus stórála peitril ar scála mór;
- Sceitheadh fuíolluisce uirbigh;
- Úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe;
- Foinsí radaíochta ianúcháin;
- Astaíochtaí gás ceaptha teasa ó thionscal agus ón eitlíocht trí Scéim an AE um Thrádáil Astaíochtaí.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil

- Iniúchadh agus cigireacht ar shaoráidí a bhfuil ceadúnas acu ón GCC;
- Cur i bhfeidhm an dea-chleachtais a stiúradh i ngníomhaíochtaí agus i saoráidí rialáilte;
- Maoirseacht a dhéanamh ar fhreagrachtaí an údaráis áitiúil as cosaint an chomhshaoil;
- Caighdeán an uisce óil phoiblí a rialáil agus údaruithe um sceitheadh fuíolluisce uirbigh a fhorfheidhmiú
- Caighdeán an uisce óil phoiblí agus phríobháidigh a mheasúnú agus tuairisciú air;
- Comhordú a dhéanamh ar líonra d'eagraíochtaí seirbhíse poiblí chun tacú le gníomhú i gcoinne coireachta comhshaoil;
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Dramhaíola agus Ceimiceáin sa Chomhshaol

- Rialacháin dramhaíola a chur i bhfeidhm agus a fhorfheidhmiú lena n-áirítear saincheisteanna forfheidhmithe náisiúnta;
- Staitisticí dramhaíola náisiúnta a ullmhú agus a fhoilsiú chomh maith leis an bPlean Náisiúnta um Bainistíocht Dramhaíola Guaisí;
- An Clár Náisiúnta um Chosc Dramhaíola a fhorbairt agus a chur i bhfeidhm;
- Reachtaíocht ar rialú ceimiceán sa timpeallacht a chur i bhfeidhm agus tuairisciú ar an reachtaíocht sin.

Bainistíocht Uisce

- Plé le struchtúir náisiúnta agus réigiúnacha rialachais agus oibriúcháin chun an Chreat-treoir Uisce a chur i bhfeidhm;
- Monatóireacht, measúnú agus tuairisciú a dhéanamh ar chaighdeán aibhneacha, lochanna, uiscí idirchreasa agus cósta, uiscí snámha agus screamhuisce chomh maith le tomhas ar leibhéil uisce agus sreabhadh abhann.

Eolaíocht Aeráide & Athrú Aeráide

- Fardail agus réamh-mheastacháin a fhoilsiú um astaíochtaí gás ceaptha teasa na hÉireann;
- Rúnaíocht a chur ar fáil don Chomhairle Chomhairleach ar Athrú Aeráide agus tacaíocht a thabhairt don Idirphlé Náisiúnta ar Ghníomhú ar son na hAeráide;
- Tacú le gníomhaíochtaí forbartha Náisiúnta, AE agus NA um Eolaíocht agus Beartas Aeráide.

Monatóireacht & Measúnú ar an gComhshaol

- Córais náisiúnta um monatóireacht an chomhshaoil a cheapadh agus a chur i bhfeidhm: teicneolaíocht, bainistíocht sonraí, anailís agus réamhaisnéisiú;
- Tuairiscí ar Staid Thimpeallacht na hÉireann agus ar Tháscairí a chur ar fáil;
- Monatóireacht a dhéanamh ar chaighdeán an aeir agus Treoir an AE i leith Aeir Ghlain don Eoraip a chur i bhfeidhm chomh maith leis an gCoinbhinsiún ar Aerthruailliú Fadraoin Trasteorann, agus an Treoir i leith na Teorann Náisiúnta Astaíochtaí;
- Maoirseacht a dhéanamh ar chur i bhfeidhm na Treorach i leith Torainn Timpeallachta;
- Measúnú a dhéanamh ar thionchar pleananna agus clár beartaithe ar chomhshaol na hÉireann.
- Taighde agus Forbairt Comhshaoil
- Comhordú a dhéanamh ar ghníomhaíochtaí taighde comhshaoil agus iad a mhaoiniú chun brú a aithint, bonn eolais a chur faoin mbeartas agus réitigh a chur ar fáil;
- Comhoibriú le gníomhaíocht náisiúnta agus AE um thaighde comhshaoil.

Cosaint Raideolaíoch

- Monatóireacht a dhéanamh ar leibhéil radaíochta agus nochtadh an phobail do radaíocht ianúcháin agus do réimsí leictreamaighnéadacha a mheas;
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha;
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta;
- Sainseirbhísí um chosaint ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Ardú Feasachta agus Faisnéis Inrochtana

- Tuairiscú, comhairle agus treoir neamhspleách, fianaise-bhunaithe a chur ar fáil don Rialtas, don tionscal agus don phobal ar ábhair maidir le cosaint comhshaoil agus raideolaíoch;
- An nasc idir sláinte agus folláine, an geilleagar agus timpeallacht ghlan a chur chun cinn;
- Feasacht comhshaoil a chur chun cinn lena n-áirítear tacú le hiompraíocht um éifeachtúlacht acmhainní agus aistriú aeráide;
- Tástáil radóin a chur chun cinn i dtithe agus in ionaid oibre agus feabhsúchán a mholadh áit is gá.

Comhpháirtíocht agus líonrú

- Oibriú le gníomhaireachtaí idirnáisiúnta agus náisiúnta, údaráis réigiúnacha agus áitiúla, eagraíochtaí neamhrialtais, comhlachtaí ionadaíocha agus ranna rialtais chun cosaint chomhshaoil agus raideolaíoch a chur ar fáil, chomh maith le taighde, comhordú agus cinnteoireacht bunaithe ar an eolaíocht.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil

Tá an GCC á bhainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóir. Déantar an obair ar fud cúig cinn d'Oifigí:

- An Oifig um Inbhuanaitheacht i leith Cúrsaí Comhshaoil
- An Oifig Forfheidhmithe i leith Cúrsaí Comhshaoil
- An Oifig um Fhianaise agus Measúnú
- An Oifig um Chosaint ar Radaíocht agus Monatóireacht Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tugann coistí comhairleacha cabhair don Ghníomhaireacht agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

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An Ghníomhaireacht um Chaomhnú Comhshaoil

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