

Circular Taxation

A policy approach to reduce resource use and accelerate the transition to a circular economy

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Report For

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Executive Summary



Environmental taxation has the potential to play a key role in delivering on the European Green Deal objectives and incentivising the shift towards a sustainable, decarbonised economy. The European Commission has explicitly highlighted that well-designed tax reforms can “play a direct role by sending the right price signals and providing the right incentives for sustainable behaviour by producers, users and consumers”.¹ However, in 2020 environmental taxes constituted less than 6% of all Member States’ revenue from taxes and social contributions.² Of the total of environmental taxes, more than three quarters were taxes on energy, while less than 4% were taxes on pollution or the use of resources.

Such limited application of taxation to address resource consumption appears to be a missed opportunity given that approximately half of global emissions are associated with production and consumption. Material production and consumption alone accounts for 23% of total global emissions while food production and consumption accounts for a further 26%.

Using taxation to reduce material consumption and the related embodied emissions through promoting activities consistent with a circular economy should thus be a priority for effective climate action. The European Environmental Bureau commissioned this study to raise awareness among practitioners and policymakers of the nascent concept of ‘circular taxation’ and of its potential to incentivise a shift towards a circular economy.

Circular taxation should provide clear incentives to step away from the wasteful linear economy and contribute to the needed systemic change to a circular economy which operates within planetary boundaries.

Accordingly, this study first proposes a definition of circular taxation in order to make clear how it differs from more traditional approaches to environmental taxation. A number of case studies (of environmental taxes) are then considered in order to establish whether they have elements that would be expected of circular taxation, and to seek to learn lessons for the application of circular taxation, especially in respect of barriers to be overcome. Several recommendations are then presented on the effective implementation of circular taxation in EU Member States in order to incentivise the quick and efficient transition to a resource efficient circular economy. Recommendations are also made as to the possible uses of revenue raised through circular taxation, with a specific focus on considerations of equity and just transition.

Definition

To provide conceptual clarity on the meaning and goals, the following definition is proposed for Circular Taxation:

“Environmental taxes that go beyond the objective of internalising external costs, focusing on reducing the extraction, production and consumption of resources, retaining material values, and providing incentives for designing out waste and pollution”.

This definition has been chosen to capture the core elements we believe a circular tax should target, differentiating it from the broader term of environmental taxation, and instead focusing on reducing resource consumption with the goal of staying within the planetary boundaries. **The concept of circular taxation moves the discussion on from ‘getting the prices right’ (environmental taxes) to using taxation as an effective and efficient means of achieving specific societal objectives.**

¹ European Commission (2019) *The European Green Deal: Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions*

² IEEP et al. 2021. Green taxation and other economic Instruments: Internalising environmental costs to make the polluter pay.

Case studies

While the concept of circular taxation is still in its infancy, four case studies of environmental taxes (that cover examples of all product lifecycle stages from extraction to disposal) have been analysed. The case studies do not necessarily meet the above definition of 'circular taxation', but findings in respect of positive elements as well as challenges and drawbacks have been used to inform recommendations in respect of circular taxation.

- The **EU plastics own resource**, selected as a quasi-resource tax, is a national contribution to the EU budget, which sets a rate for non-recycled plastic packaging waste. It is being implemented in different ways across the Member States (some are introducing national plastic taxes), but not all methods are designed to be leading to behaviour changes. The overall effects are yet to be determined and will depend greatly on the way the costs of the contribution are covered by Member States.
- Different taxes are applied to **vehicles** and have different impacts on the consumers, either at the moment of purchase or when deciding on the mode of transport for each journey: vehicle excise duty, fuel tax duties and road user charging. Finally, the high value of the product itself has led to different consumption methods under the umbrella of 'shared automobility'.
- A relief tax, the **Swedish VAT reduction for repair**, yielded mixed results and showed implementation challenges, especially in the area of communication to consumers. Repair is a labour-intensive activity and the VAT reduction aimed to make repair services more affordable to consumers, which extend product lifetime.
- A waste tax, the **UK landfill tax**, has yielded positive impacts in terms of raised revenue, landfill diversion and increased recycling rates; however, it also has its downsides such as the increase of incineration (due to the lack of an accompanying incineration tax) or incentivising a lucrative illegal market as a result of a lack of effective monitoring and enforcement.

A number of barriers have been identified from the case studies and literature review, some of which relate circular taxation specifically, while others relate to environmental taxation more generally. These affect different actors: implementing government bodies, tax collection bodies, producers and consumers.



Implementing Government Bodies

- Data requirements for effective tax design
- Limited knowledge and experience of circular taxation

Tax Collection Bodies

- Difficulty of tax collection
- Issues with compliance and enforcement



Consumers

- Public perception and political feasibility
- Consumer incentives
- Preference for ownership
- Higher upfront cost of circular products
- Lack of knowledge on maintenance, repairability and reuse (and lack of accessibility of these options)
- Lack of convenient circular end-of-life options

Producers

- Concerns about lack of enforcement and competitiveness
- Administrative burden
- Political feasibility



A set of recommendations to overcome these barriers has been proposed, both for the design of the circular instruments and for their implementation, as outlined in the next section.

Recommendations for design and implementation

The design and implementation aspects of circular taxation are summarised below.

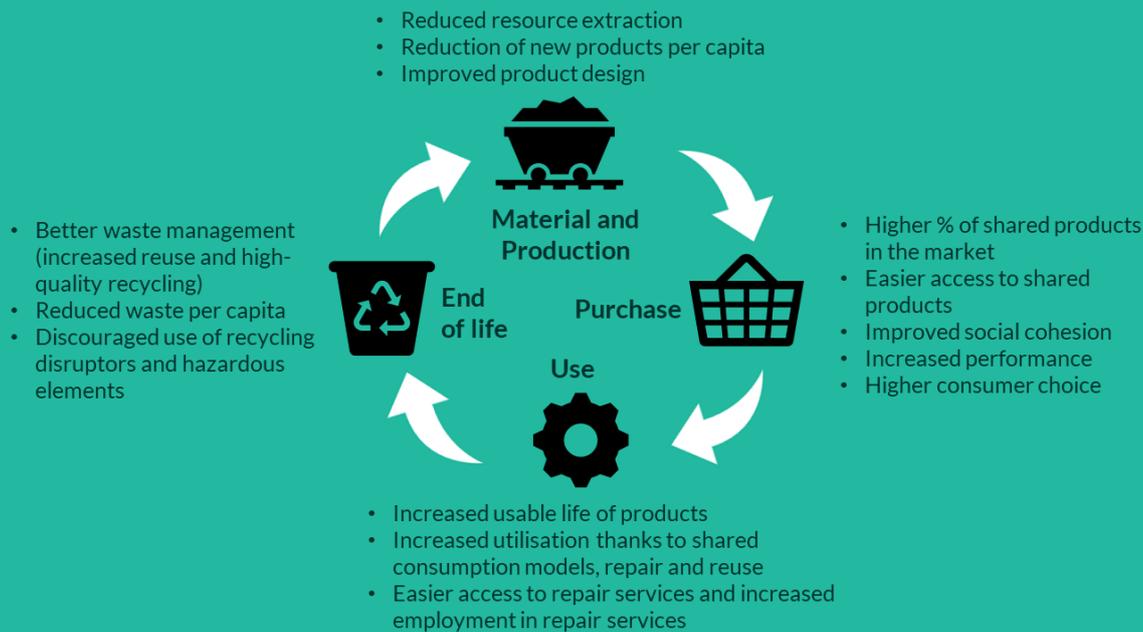
Tax Rate	Stakeholder Support & Communication	Compliance, Monitoring & Enforcement	Use of Revenue & Systemic Tax Shift
<ul style="list-style-type: none"> • Make purchasing new, linear products more expensive relative to circular alternatives • Use (part of) the revenue collected from circular tax to invest in circular solutions & infrastructures • Adjust the tax rate once market has had time to respond • Increase tax rate over time • Avoid loopholes and perverse behaviour (exemptions) 	<ul style="list-style-type: none"> • Communicate the rationale and benefits of the circular tax • Announce the introduction in advance of the implementation date • Ensure availability of alternatives or substitutes and reinforce the emergence of alternative consumption models 	<ul style="list-style-type: none"> • Ensure appropriate monitoring and enforcement including provision of funding • Provide supporting infrastructure to prevent perverse behaviour • Ensure penalties are high enough to disincentivise non-compliance 	<ul style="list-style-type: none"> • Use in government general budget • Transfer the tax burden from labour to pollution and resources • Invest in advancement of circularity, via R&D and/or infrastructure • Mitigate negative distributional impacts

Tax policy coordination

Harmonisation across the markets can help avoid tax competition within the EU and maximise the signal for change to producers and providers. In the European Union with three distinct levels of governance, each actor has a key role to play in the deployment of circular taxation. The EU should set the **circular economy ambition and targets** as well as provide oversight, coordination, a level playing field and, where possible, set minimum tax rates through implementing a common framework for circular taxation at the EU level. Member States have the competency and hence the responsibility to **design, implement and monitor circular taxes**, while cities and regions can **pioneer novel taxes** before rolling these out in the rest of the Member States. More detailed commentary is provided in the dedicated chapter 5.0 of this report.

Expected impacts of circular taxation

Circular taxation can reduce consumption and overall use of resources and lead to positive environmental impacts (lower carbon and material footprints), helping **transform our linear wasteful economies into efficient circular economies**. Taxes will affect different stages of the product lifecycle contributing to different impacts across the product lifecycle.



This shift will require changes in the behaviours of both consumers and producers, and circular taxation can provide the **right incentives and price signals**.

Conclusions

Circular taxation instigates the principle of **setting a tax of sufficient magnitude that by providing a clear price signal brings about a certain level of behaviour change**, leading to a reduction in both resource use and resource waste. Despite its applicability and potential impact across the economy, the concept of circular taxation is still in its infancy.

A more targeted approach to fiscal reform is required – it is imperative circular taxes play an increasingly prominent role in driving forward an economy acting within planetary boundaries and be deployed across multiple sectors and product categories.

This report has discussed the environmental and social impacts of four environmental tax case studies across extraction, production, purchase, use and end of life stages, and discussed how some of the barriers these have faced can be overcome through tax design, tax rates, stakeholder communication, effective compliance, monitoring and enforcement, and revenue recycling. **Widespread implementation of circular taxation across Europe can be further supported through harmonisation across different markets by implementing a common framework for circular taxation at the EU level.** This could be achieved by moving from the current requirement of unanimity under a special legislative procedure for tax policy decisions at the EU level to qualified majority voting under the ordinary legislative procedure.

In addition, while EU can set ambitious environmental targets to incentivise Member States to make their taxes more circular, develop guidance on how revenue should be used, and fight against tax evasion and tax avoidance, Member States retain the main competence (and hence responsibility) to deploy circular taxation. Finally, the different cities and regions within the Member States can pioneer the implementation of different circular taxes through conducting pilot tax schemes or educating the public through positive media campaigns.

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1.0 Introduction

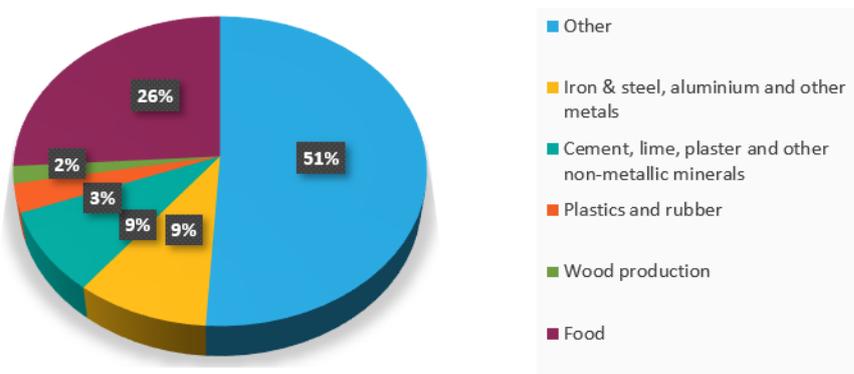
1.1 Background

Environmental taxation has the potential to play a key role in delivering on the European Green Deal objectives and incentivising the shift towards a sustainable, decarbonised economy. The European Commission has explicitly highlighted that well-designed tax reforms can “play a direct role by sending the right price signals and providing the right incentives for sustainable behaviour by producers, users and consumers”.³ However, in 2020 environmental taxes constituted less than 6% of all Member States’ revenue from taxes and social contributions.⁴ Of the total of environmental tax revenues, more than three quarters were from taxes on energy, while less than 4% were from taxes on pollution or the use of resources (that is 4% of 6%=0,24%).

The focus of environmental taxation so far has primarily been on control and reduction of GHG emissions linked to energy use through the internalisation of externalities rather than promoting the transition to a sustainable circular economy.

Approximately half of global emissions are associated with production and consumption. The Intergovernmental Panel on Climate Change (IPCC) has called for a deep reduction of greenhouse gas (GHG) emissions by 2030 (50% reduction by 2030 relative to 2019 levels),⁵ which sets the level of ambition and urgency. Material production alone accounts for 23% of total global emissions and food production accounts for a further 26% (as shown in the figure below). Therefore, using fiscal instruments, and other forms of price-based measures to reduce material consumption and consequently the related embodied emissions should be a priority for effective climate action.

Figure 1 Source of Global GHG Emissions⁶



A report by Material Economics found that adopting circular economy strategies in just five key sectors (cement, aluminium, steel, plastics and food) could eliminate almost half of the current emissions from the production of goods in these areas. This is estimated to be ~9.3 billion tonnes of CO₂e in 2050, equivalent to cutting current emissions

³ European Commission (2019) *The European Green Deal: Communication from the Commission to the European Parliament, the European Council, the council, the European Economic and Social Committee and the Committee of the Regions*

⁴ IEEP et al. 2021. Green taxation and other economic Instruments: Internalising environmental costs to make the polluter pay. https://ec.europa.eu/environment/system/files/2021-11/Green%20taxation%20and%20other%20economic%20instruments%20%E2%80%93%20Internalising%20environmental%20costs%20to%20make%20the%20polluter%20pay_Study_10.11.2021.pdf

⁵ IPCC (2022), *Climate Change 2022: Mitigation of Climate Change*, https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SPM.pdf

⁶ IRP (2020). Resource Efficiency and Climate Change: Material Efficiency Strategies for a Low-Carbon Future. Summary for Policymakers, A report of the International Resource Panel. United Nations Environment Programme, Nairobi, Kenya; Poore, J., and Nemecek, T. (2018). Reducing food’s environmental impacts through producers and consumers. *Science*, 360(6392), 987-992. <https://wedocs.unep.org/20.500.11822/31715>

from all transport to zero.⁷ Meanwhile a report by Circle Economy found that “through smart strategies and reduced material consumption [...] the circular economy has the power to shrink global GHG emissions by 39% and cut virgin resource use by 28%.”⁸ In the current context of multiple environmental crises (climate, biodiversity and pollution), the circular economy has a key role to play. It can address a key underlying cause of biodiversity loss; our extractive, wasteful and polluting economy, and it can also help in tackling the climate crisis by reducing greenhouse emissions associated with the production and consumption of goods.^{9,10}

Moreover, it is important to note that the current situation is one of significant global disparities in wealth, and associated variations in consumption. The wealthiest nations are exhibiting the greatest levels of ‘over-consumption’ (the material footprint of low-income countries is 2 metric tons per person, compared to 26.3 for high-income countries)¹¹ which is further increasing global inequalities. **A circular economy should be a socially just economy**, and while the overall goal should be a reduction in the consumption of material resources globally, there should also be a movement towards greater equality in terms of access to the services those resources provide.

The transition to a more circular economy is associated with increased adoption of **labour-intensive business models**, such as rental models, R&D, repair and recycling. According to taxation trends in the European Union, currently more than 50% of all tax revenues in the EU comes from taxes on labour.¹² This makes labour very expensive while resource use and pollution remain largely undertaxed. Thus, the current tax system is a barrier for the transition towards a more circular economy, and a shift in taxation which will decrease the costs of labour and increase the cost of natural resources is a pre-condition for a transition toward an inclusive circular economy.¹³ It is important to note that we propose a shift in what is *taxed* and where the tax revenue comes from, not necessarily a shift in how *tax revenue* is spent. The tax shift should therefore not undermine the current level of public spending in welfare services, on the contrary it could liberate additional revenues to better finance essential public services and social and unemployment schemes. Despite its relevance and urgency, the concept of **circular taxation is still in its infancy**. Research related to appropriate circular tax interventions for a resource efficient circular economy is limited and most practical experience and applications typically relate to waste management charges, overlooking upstream stages.¹⁴ Accordingly, this study seeks to further develop the concept, and more fully identify the role that circular taxation can play in speeding up the transition to a genuinely circular economy.

1.2 Report Approach and Layout

The specific objectives of the study, and the sections of the report in which they are addressed, are shown in Figure 2. The study draws on relevant existing literature, case study examples, internal workshops, and engagement with expert practitioners from the European Commission, Member States and external advisors to the European Union on environmental taxation. The analysis is predominantly qualitative in nature.

⁷ Ellen MacArthur Foundation (2019), *Completing the Picture: How the Circular Economy Tackles Climate Change*. Available at: www.ellenmacarthurfoundation.org/publications

⁸ Circle Economy (2021), *The Circularity Gap report (2021)*. Available at: <https://www.circularity-gap.world/2021>

⁹ Ellen MacArthur Foundation (2021) *The Nature Imperative: How the circular economy tackles biodiversity loss*. Available at: <https://emf.thirdlight.com/link/bgqxl2mlprld-v7i2m6/@/>

¹⁰ Ellen MacArthur Foundation (2021) *Completing the Picture - How the circular economy tackles climate change*. Available at: <https://emf.thirdlight.com/link/w750u7vysuy1-5a5i6n/@/preview/1?o>

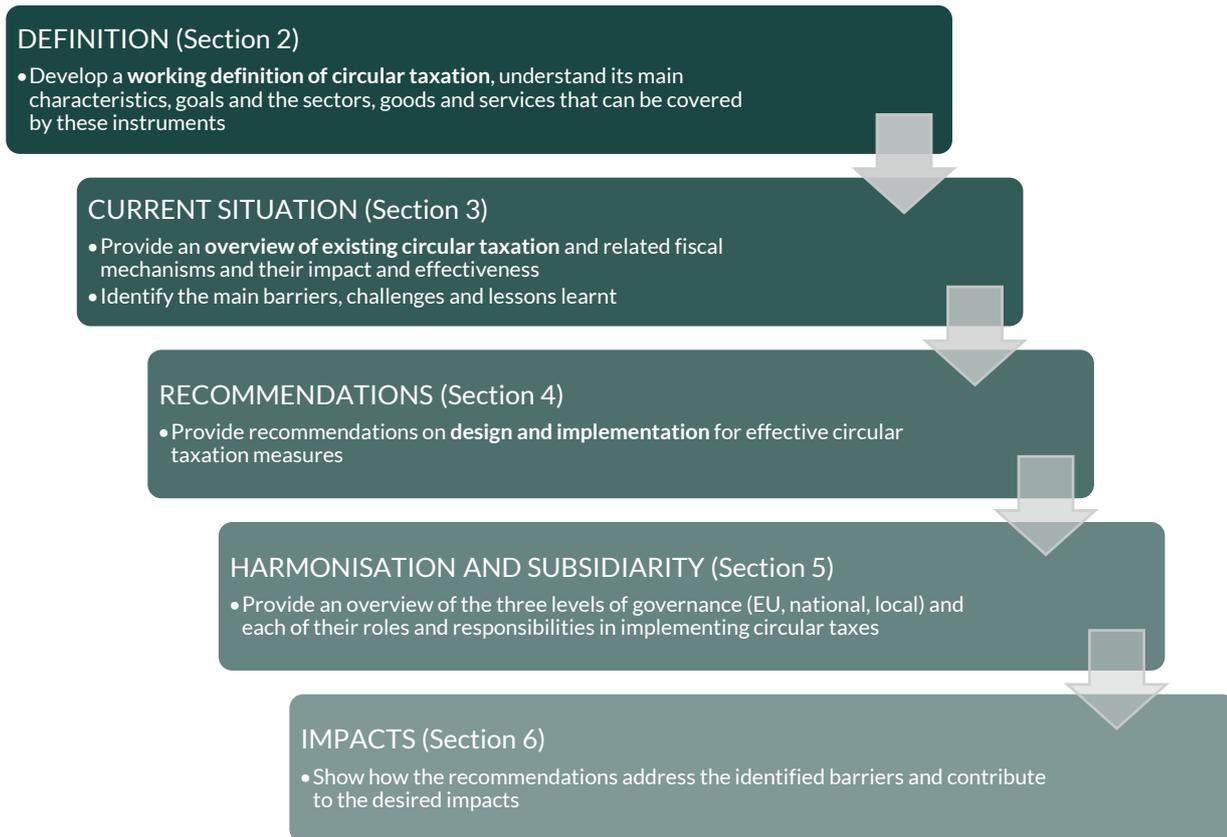
¹¹ United Nations (2019) *Ensure sustainable consumption and production patterns*. Available at: <https://unstats.un.org/sdgs/report/2019/goal-12/>

¹² European Commission, Directorate-General for Taxation and Customs Union, *Taxation trends in the European Union: data of the EU Member States, Iceland, Norway and United Kingdom: 2021 edition*, Publications Office, 2021, <https://data.europa.eu/doi/10.2778/843047>

¹³ The Ex'tax Project (2022). *The Taxshift: An EU Fiscal Strategy to Support the Inclusive Circular Economy* <https://ex-tax.com/taxshift/>

¹⁴ Vence, X.; López Pérez, S.d.J. *Taxation for a Circular Economy: New Instruments, Reforms, and Architectural Changes in the Fiscal System*. Sustainability 2021, 13, 4581. <https://doi.org/10.3390/su13084581>

Figure 2 Specific objectives of the study



2.0 Defining Circular Taxation

In order to develop a working definition of circular taxation, we first consider what a circular economy seeks to achieve, and we then consider the potential role of circular taxes.

There are several definitions and frameworks for the circular economy. Two of the most well-known and relevant conceptual frames are “the butterfly diagram” (Figure 3) and “the 9Rs framework” (Figure 4).

Figure 3 Circular economy systems diagram (also known as ‘the butterfly diagram’)¹⁵

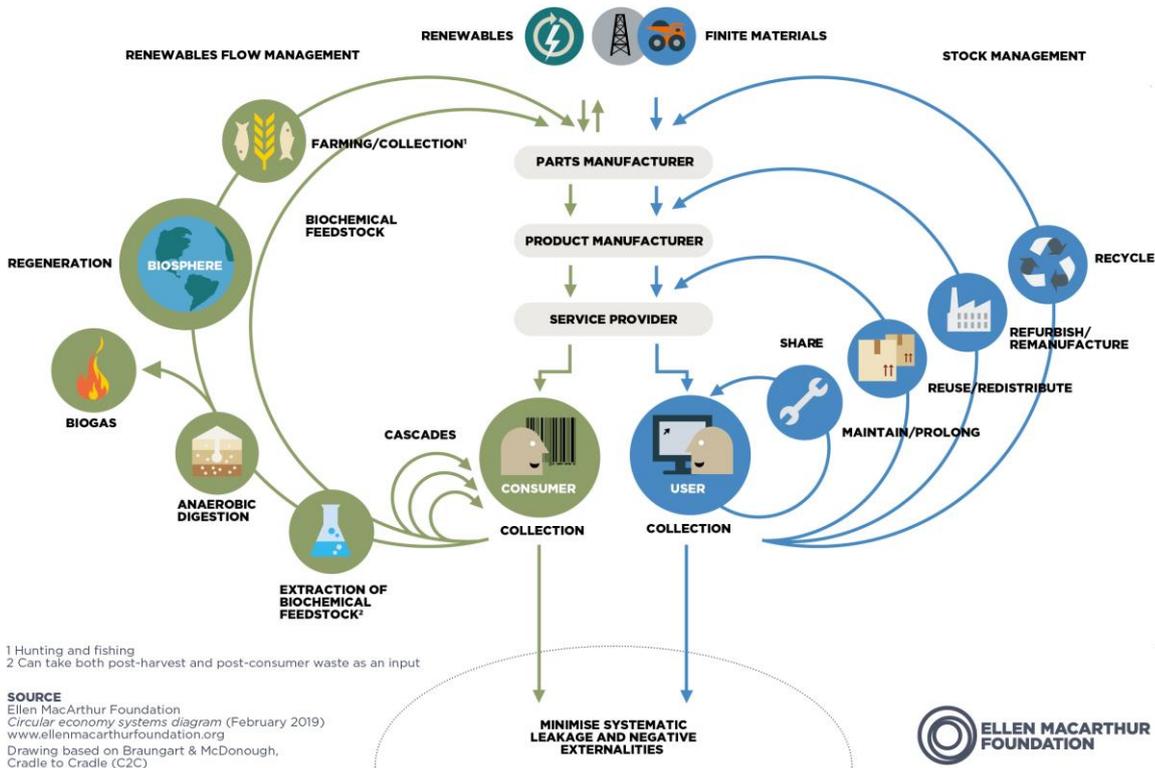
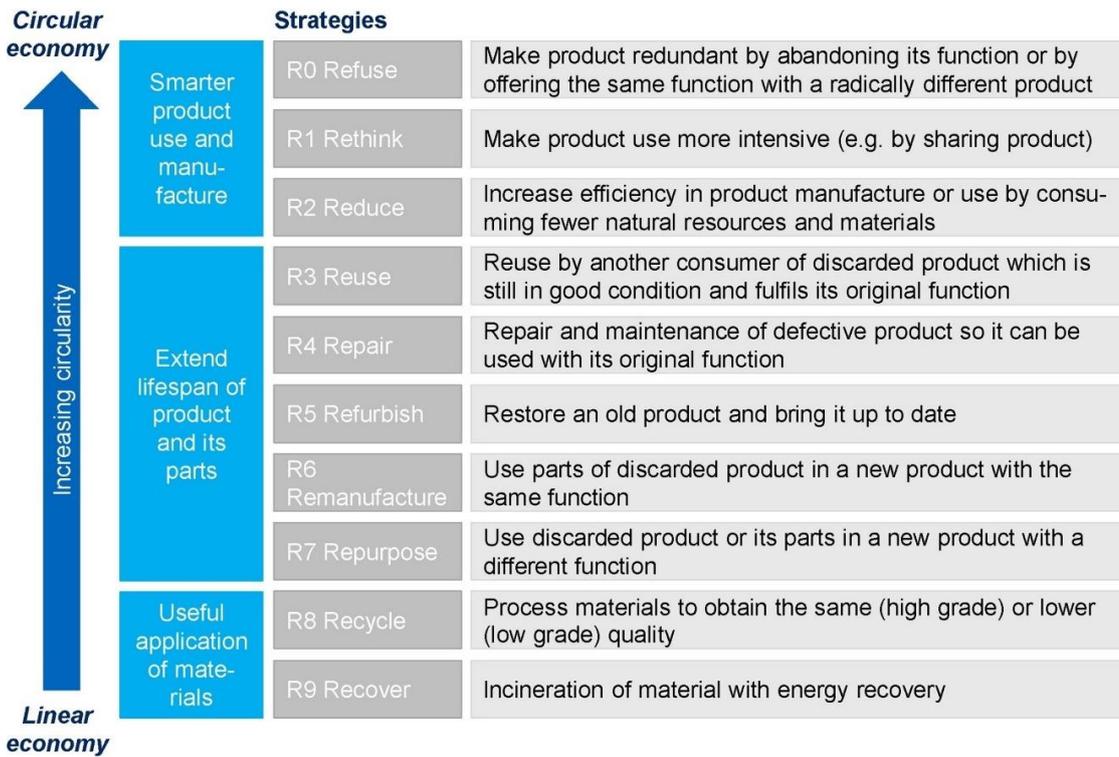


Figure 3 frames the circular economy as a system in which materials predominantly flow in a circular fashion, as opposed to a linear fashion. In other words, materials are, to the extent possible, returning into the system rather than leaving the system as soon as they are used or consumed once. The butterfly diagram shows two main cycles – the technical cycle (on the right) and the biological cycle (on the left). This study’s main focus is on the technical cycle, the right ‘wing’ of the butterfly, which shows products and materials being kept in circulation through processes such as reuse, repair, remanufacture and recycling. Importantly – and this is not immediately evident from the diagram itself – to reap the environmental benefits of a circular economy, the flows of finite materials *into* the system should be minimised, flows *around* the technical cycles should be minimised (and as far as possible focused on the smallest loops), and materials should also move slowly – that is, products should be durable, thus maintaining their highest value for as long as possible.

Whereas Figure 3 shows how the circular economy should work as a system, Figure 4 sets it in terms of a hierarchy, outlining the order of priority and hierarchy for action in transitioning towards a circular economy.

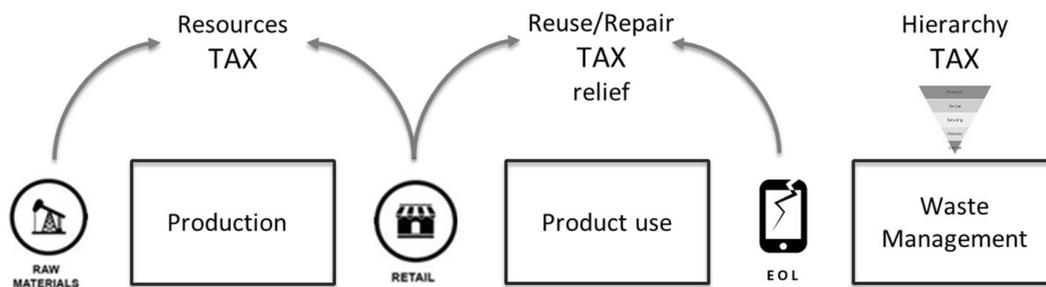
¹⁵ Ellen MacArthur Foundation, Circular economy systems diagram (February 2019), available at: <https://ellenmacarthurfoundation.org/circular-economy-diagram>

Figure 4 9Rs framework of a circular economy¹⁶



A 2019 paper by Milios, while not explicitly using the term ‘circular taxation’, developed a ‘Circular Economy Taxation Framework’ based on resource, product and waste taxes. This framework takes into consideration the different life-cycle stages of products, from resource extraction and input, to waste disposal (see Figure 5). The study identified that the effects of environmental taxes on resource savings is currently very limited in practice, and a more targeted approach to fiscal reform is required for the circular economy.¹⁷ The taxation framework includes a raw material resource tax, a reuse/repair tax relief, and a waste hierarchy tax, as set out below.

Figure 5 Circular economy taxation framework [Milios, L. (2019)]



A more recent study presents circular taxation as an alternative to environmental taxation¹⁸, noting that it is characterised by much more ambitious objectives than environmental taxation.¹⁹ The authors state that:

Existing environmental taxes aim to reduce some externalities and give small impulses to change economic behaviour, but they leave the basic structure of the linear economy intact. On the contrary, circular taxation aims to contribute to a more radical change in the economic structure, significantly altering relative prices and changing the behaviour of firms and consumers to achieve an economy that respects the limits of the planet.

¹⁶ Julian Kirchherr, Denise Reike, Marko Hekkert, Conceptualizing the circular economy: An analysis of 114 definitions, Resources, Conservation and Recycling, Volume 127, 2017, Pages 221-232, ISSN 0921-3449, <https://doi.org/10.1016/j.resconrec.2017.09.005>.

¹⁷ Milios, L. (2019). Towards a Circular Economy Taxation Framework: Expectations and Challenges of Implementation. Circular Economy and Sustainability (2021) 1:477–498. <https://doi.org/10.1007/s43615-020-00002-z>

¹⁸ Vence, X.; López Pérez, S.d.J. Taxation for a Circular Economy: New Instruments, Reforms, and Architectural Changes in the Fiscal System. Sustainability 2021, 13, 4581. <https://doi.org/10.3390/su13084581>

¹⁹ Interestingly the authors do not provide an actual definition of circular taxation

The authors identify five main differences between circular and environmental taxation that involve:

- The recalibration of existing environmental taxes to incorporate the real prices of externalities and bring about effective change in the behaviour of economic agents, production, and consumption;
- Encouraging the extension of the useful life of goods as much as possible (taking into account the whole chain from design to consumption, repair, and reuse);
- Encouraging recycling (cradle to cradle) in a fundamental way;
- Moving from taxes on labour to taxes on the use of resources; and
- Greater use of the concepts of merit and demerit to push consumers towards the desired behaviour.²⁰

While an initial reading of the first of the above bullet points might suggest the authors are simply arguing for external costs to be internalised, they go on to clarify that a circular economy tax system is also characterised by ‘flexible taxation based on scientific and policy targets (e.g. 1.5°C warming)’, as well as ‘comprehensive taxation of land to promote optimal use’. This therefore moves the discussion on from ‘getting the prices right’, to using taxation as an effective and efficient means of achieving (or contributing to the achievement of) specific societal objectives.

In a similar vein, a 2016 report by The Ex’tax Project and partners on a fiscal strategy for an inclusive circular economy, argues for an update to our fiscal system, shifting the tax base from labour to natural resource consumption and pollution, an end to subsidies for environmentally damaging activities (e.g. fossil fuels), and shifting to ‘circular’ economies by applying principles of resource efficiency.²¹ This study also highlights that effective planning for the use of revenues is key to achieve a fair and inclusive transition to the circular economy. While it did identify a range of possible taxes, the term ‘circular taxation’ (or circular tax) was not used in the study. More recently, The Ex’tax Project and partners published a report entitled ‘The Taxshift: An EU Fiscal Strategy to Support the Inclusive Circular Economy’.²² This involved modelling a ‘circular taxshift scenario’ but again did not provide an explicit definition of circular taxation.²³ This report shows how taxes can serve societal purposes well beyond the internalisation of external costs.

2.1 Proposed Definition

The following definition of circular taxation is proposed with the aim of:

- Providing conceptual clarity on the *meaning* and *goals* of circular taxation;
- Differentiating circular taxation from the broader term of environmental taxation;
- Being self-sustaining: avoiding a simplistic definition that circular taxation is taxation that supports a circular economy, instead defining the goals of circular taxes.

The proposed definition of circular taxation is as follows:

“Environmental taxes that go beyond the objective of internalising external costs, focusing on reducing the extraction, production and consumption of resources, retaining material values, and providing incentives for designing out waste and pollution”.

²⁰ Vence, X.; López Pérez, S.d.J. *Taxation for a Circular Economy: New Instruments, Reforms, and Architectural Changes in the Fiscal System*. Sustainability 2021, 13, 4581. <https://doi.org/10.3390/su13084581>

²¹ The Ex’tax Project in cooperation with Cambridge Econometrics, Trucost, Deloitte, EY, KPMG Meijburg and PwC (2016) *New era. New plan. EUROPE A FISCAL STRATEGY FOR AN INCLUSIVE, CIRCULAR ECONOMY* <https://www.neweranewplan.com/wp-content/uploads/2016/12/New-Era-New-Plan-Europe-Extax-Report-DEF.compressed.pdf>

²² Ex’Tax (2022), *The Taxshift: An EU Fiscal Strategy to Support the Inclusive Circular Economy*, available at: <https://ex-tax.com/wp-content/uploads/2022/06/The-Taxshift-EU-Fiscal-Strategy-Extax-Project-2June22def.pdf>

²³ This scenario included introducing a kilometre charge, taxing consumption by increasing VAT rates, taxing CO2 emissions and other emissions from industry, aviation, shipping and agriculture, and increasing excise duties on tobacco. Measures were also included that put a higher price on water, waste and the use of fossil fuels in chemical processes.

In terms of the meaning and goals, the definition sets out the *direction* of the effect that an individual circular tax would have, but not the *magnitude* of the change that would be expected from any single circular tax, or indeed the overall effect. Of paramount importance, of course, is the overall effect on ‘reducing the extraction, production and consumption of resources’, and the goal of circular taxation should be to contribute (along with other existing and future policy instruments) towards a reduction in such extraction, production and consumption that is sufficient to stay within **planetary boundaries**.

In this regard the flexibility provided by going ‘beyond the objective of internalizing external costs’ is important and helps moves the debate on from seeking to identify, to an acceptable level of accuracy, the external costs. Those who might be opposed to measures to explicitly internalize costs might cast doubt on the accuracy of such cost estimates in order to seek to delay or abandon such plans. By contrast, with circular taxation, the principle of applying a **tax of sufficient magnitude that it brings about a certain level of change** is somewhat more straightforward. While external cost estimates can be used as a guide as to the minimum level of tax (which might be the same as the initial level at which the tax is set), in practice the key step in circular taxation is to implement the tax at a sufficient level. The level can subsequently be adjusted, and policymakers can, through doing so, understand the associated price elasticity, thus informing future changes in the level of the tax.

The definition does not include any mention of **social justice**, and this is deliberate. While it is key to ensure a just transition to a low carbon circular economy, there is also a risk of constraining the uptake of circular taxation if each and every circular tax is inflexibly associated with directly tackling social inequality. It is important not to set ‘hurdles’ in the path of the rollout of circular taxation, and if policymakers sought to make a pre-condition of implementation of each circular tax that it directly moves to measurable improvements in social justice, that might well impede uptake. Circular taxation can help provide ‘fiscal space’ for policymakers to lower the tax burden on labour by generating revenues for the general budget. It is, however, a question of political economy at the Member State level as to how much of the revenue raised from circular taxation is used in this way, and this study does not wish to be prescriptive in this regard.²⁴

It is useful to consider what circular taxation might encompass in practice, through the use of **illustrative examples**:

- Given the focus on reducing the extraction, production and consumption of resources, circular taxes could be applied to the **extraction of primary resources**. This would provide an incentive to shift to the use of secondary materials. While it is of paramount importance to reduce the use of virgin resources, given the need to reduce material consumption overall, secondary resources could also be subject to a tax, but at a lower level.
- On a **product level**, a circular tax could be used to change consumer behaviour in the form of:
 - Absolute avoidance of a product – e.g., a tax on disposable cups, as due to be implemented in Ireland in late 2022, to encourage consumers to use a reusable cup.
 - Using a smaller or less material intensive product – for example, flat screen TVs could be subject to a circular tax that varies by screen size, to discourage the purchase of larger screens that inherently use more resources than smaller screens. A similar approach could be applied to vehicles, where a variable purchase tax (and annual fee) that accounts for vehicle weight could be used to encourage a shift to smaller, lighter vehicles (and away from private vehicles towards active travel and public transport).

²⁴ There could be cases where governments seek to achieve revenue neutrality, but this could pose a risk of revenue instability, especially where there are uncertainties about price elasticity. In these cases, and for reasons of efficiency, it would seem more sensible to undertake the revenue neutrality aspect in aggregate way (e.g. all the revenues from circular taxes, or the revenues from several at least, are used for a specific purpose, or purposes).

- Repairing and refurbishing products to extend their usable lifetime – for example, a tax on new tyres could make retreading of tyres more attractive.²⁵
- Making use of the service provided by a product rather than purchasing a product – for example through a tax on products to encourage greater use of sharing models (e.g., tool libraries).
- In order to promote clean and safe circulation loops, and encourage high levels of high-quality recycling of materials that have reached the end of their useful life, circular taxation could be used to discourage the use of recycling disruptors or hazardous elements.²⁶

There is also a key question as to the appropriate use of **sustainable and renewable raw materials**. While not covered in the definition – which focuses on reduced consumption across the board, rather than material substitution – there will be examples where such material substitution is clearly beneficial, such as the use of cross-laminated timber (CLT) for construction in place of concrete and steel. Such substitutions could be encouraged through taxation – but is not the focus of this study as the merit of material switches would have to be carefully assessed on a case-by-case basis.²⁷

More broadly, there is also a potential role for taxation to **reconfigure the built environment** in such a way as to reduce the demand for materials. For example, low density residential sprawl requires a large amount of connecting infrastructure (roads, water and sewerage, gas, electricity, etc.) as well as high levels of car dependency. By contrast, a more compact, high density urban form, with three to four story buildings accommodating mixed commercial and residential use requires less in the way of connecting infrastructure (on a per unit and per capita basis) and encourages active travel and use of public transport, with associated lower levels of car ownership and dependency. Such taxation, to encourage efficient land use, with associated follow-on resource efficiency benefits does not fit neatly within the definition of circular taxation above, and while important, is not a focus of this study.

2.2 Scope of Instruments Considered

This study aims to analyse and recommend improvements on **fiscal measures to speed up the transition to a Circular Economy**. These measures include:

- **Taxes:** Levied by the government and are, by definition, not earmarked. Examples include Value Added Tax (VAT), corporate tax or carbon tax;
- **Tax reliefs:** Discounts or rebates on the taxes;
- **Charges:** Levied against a service rendered, for example a water charge; and
- **Other fiscal measures:** Can include innovative schemes such as the EU plastics own resource (see Section 3.1.1).

There are other fiscal, non-fiscal and financial measures that are important and relevant in the shift towards a circular economy, but these are not the focus of this study:

²⁵ As with most if not all potential circular taxes, the wider policy framework is important. In the case of retreading of tyres, there is a role for standards and market surveillance (to give consumers confidence that retreaded tyres are as safe as new tyres), and a role for Green Public Procurement whereby requirements for retreading tyres on public vehicle fleets will help establish the supply side infrastructure – i.e. a network of retreading providers – that will then enable retreading to be scaled up as the tax is implemented/increased. Other measures such as EPR for tyres are obviously important, and requiring EPR fees to be paid for new tyres only will serve to make retreading more attractive. However, as EPR is constrained by cost coverage, it may not provide much of an incentive. Circular taxation is not constrained in the same way, and could thus make a real difference.

²⁶ While circular taxation could be used, other policy measures such as standards, minimum requirements, and/or fee modulation within EPR – individually or in combination – might be more appropriate.

²⁷ Other approaches, such as Green Public Procurement, or Building Codes could also be used, and may be more appropriate.

- **Extended Producer Responsibility (EPR)** is an instrument that applies the ‘polluter pays’ principle; it aims to make producers responsible for the entire life-cycle of the product, which so far has been focused on the end of life. Eco-modulation of the EPR fees can help shift product design to more sustainable alternatives;^{28, 29}
- **Deposit Return Systems (DRS)** are widely applied for drink containers – the consumer pays a small deposit upon purchasing the beverage and the deposit is refunded when the container is returned to approved return points;
- **Preferential lending rates** refer to funding instruments that are conditioned on environmental or social performance and can act as a useful incentive;
- **Subsidies** are provided by governments to encourage key activities. It is important to both subsidise environmentally-friendly activities and stop incentivising the polluting ones. Example: circular activities as a pre-condition to get tax reliefs, subsidies or investments.³⁰
- **R&D and infrastructure support** – The shift to a circular economy requires research into new technologies (for example, fibre-to-fibre recycling) as well as development of existing products, technologies and infrastructures to make circular alternatives more efficient and cost-competitive.
- **Green public procurement (GPP) and circular public procurement** leverage the purchasing power of public authorities to speed up the transition to a circular economy across three levels: system, supplier and product level.³¹
- **Product standards, including eco-design** set minimum requirements for product design and performance and, when mandatory, can help remove the more linear products from the market. While not an economic instrument *per se*, it can have economic implications, for example in the case of warranty.

3.0 Review of examples of existing environmental taxation

In this section we consider a number of case study examples of environmental taxation, and we discuss whether these can be considered examples of *circular* taxation. The case studies do not necessarily meet the definition of ‘circular taxation’ (see section 2.1) - the positive elements have been analysed as well as their challenges and drawbacks. We also draw lessons learnt for future circular taxation approaches.

3.1 Case Studies

Four types of fiscal instruments have been considered, in order to cover the whole life cycle of a product (from extraction to disposal): 1) Resource taxes, 2) Product taxes, 3) Tax reliefs, and 3) Waste taxes. Table 1 below shows the relationship between the four stages of the product lifecycle and the four types of taxes, describing how taxes can

²⁸ Anurodh Sachdeva, Ariel Araujo and Dr. Marin Hirschnitz-Garbers (2021), *Extended Producer Responsibility and Ecomodulation of Fees. Opportunity: Ecomodulation of Fees as a Way Forward for Waste Prevention*, available at: <https://eeb.org/library/extended-producer-responsibility-and-ecomodulation-of-fees/>

²⁹ European Environmental Bureau (2021) *Extended Producer Responsibility and Ecomodulation of Fees*, available at: <https://eeb.org/library/extended-producer-responsibility-and-ecomodulation-of-fees/>

³⁰ Though subsidies are a fiscal instrument, they are out of scope of this study.

³¹ European Commission (2017), *PUBLIC PROCUREMENT FOR A CIRCULAR ECONOMY. Good practice and guidance*, available at: https://ec.europa.eu/environment/gpp/pdf/CP_European_Commission_Brochure_webversion_small.pdf

encourage or disincentivise certain products and behaviours. These case studies will be used to extract lessons learnt that will inform the recommendations in Section 4.0.

Table 1 Mapping of product lifecycle vs. types of taxes (examples *in green* and selected case studies *in purple*)

Product lifecycle	Types of taxes and examples
Material and production	<p>Resource taxes: Penalise extraction of virgin material. <i>E.g. aggregates levy, EU Plastics own resources (indirectly)</i></p> <p>Tax relief: Incentivise recycled or renewable content, <i>E.g. exemption from Plastic Packaging Tax</i></p>
Purchase	<p>Resource taxes: Indirectly affecting the purchase stage, <i>E.g. aggregates levy, EU Plastics own resources</i></p> <p>Product taxes: Disincentivise purchase of specific products. <i>E.g. vehicle excise duty, coffee cup levy, tax on new tyres, tax on steel or concrete for construction, tax on TV screens varying by screen size</i></p> <p>Tax relief: Incentivise purchase of specific products. <i>E.g. reduced vehicle excise duty for EVs, reduced tax on the use of cross-laminated timber for construction</i></p>
Use	<p>Product taxes: Disincentivise use of specific products. <i>E.g. taxes on petrol, CO2, fertiliser, road-user charge</i></p> <p>Tax relief: Incentivise use of specific products. <i>E.g. tax relief for biofuel, tax relief for sharing models</i></p> <p>Waste taxes: Any advance waste management fee is paid for the new product, not the second-hand item</p>
End-of-life	<p>Resource tax: A resource tax can indirectly incentivise recycling to produce secondary raw materials. <i>E.g. EU Plastics Own Resource</i></p> <p>Tax relief: Incentivise repair/ remanufacturing. <i>E.g. Swedish VAT relief on repair</i></p> <p>Waste taxes: Waste management taxes can incentivise appropriate disposal routes, recycling instead of landfilling or incinerating. <i>E.g. Landfill tax, Incineration tax, pay-as-you-throw charges (PAYT)</i></p>

Four case studies have been selected, one for each type of fiscal instrument (see Sections 3.1.1 to 3.1.4). The selection has aimed to find **diversity in the case studies** so that lessons learnt can be extrapolated from different backgrounds and applications. Thus, the four case studies reflect different products/sectors, different levels of success, different stages of the lifecycle, and different incentives for producers and consumers. For each case study, a justification for selection has been provided, and the tax design has been analysed alongside the impacts and the implementation framework. The lessons learnt from these case studies inform the recommendations (Section 4.0).

3.1.1 Resource Tax – EU Plastics Own Resource

Reason for selection: While not a tax *per se*, the EU Plastics Own Resource is an **innovative instrument** that is directly linked to consumption and end-of-life management of resources. It can also act as a resource tax through incentivising design changes to increase recyclability of materials and shift away from single-use plastic packaging towards reusables, thus requiring lower level of primary resource extraction. Member States have chosen different ways to apply this in their national territory, which has yielded different insights.

The EU’s Plastics Own Resource came into force on 1st January 2021. It is a contribution made by each Member State to the EU budget, **based on the amount of non-recycled plastic packaging waste the Member State generates**. The contribution is calculated at a rate of EUR 0.8 per kilogram of plastic packaging waste that is not recycled. A

mechanism is in place to avoid excessive contributions from less wealthy Member States.³² It is estimated that this plastics contribution could generate EUR 6 to 8 billion of additional revenue for the EU each year.³³ The policy is expected to “encourage Member States to reduce packaging waste and stimulate Europe's transition towards a circular economy by implementing the European Plastics Strategy”.³⁴

How Member States are applying the Plastics Own Resource

The Plastics Own Resource is a national contribution by Member States to the EU budget. The contributions are not earmarked and end up in the general EU budget. Member States may pay the contribution from their own general budget; they are not forced to introduce a national plastics tax to recuperate these resources. However, since the introduction of the EU Plastics Own Resource, some Member States – for example, Spain and Italy are in the process of introducing, **new plastic taxes** (see Table 2 for details). Table 2 also presents another example of a plastic packaging tax introduced by the UK, which is not part of the EU Own Resource, rather it was introduced as an incentive for increasing the recycled content of plastic packaging. These taxes may encourage a shift in behaviour towards the production and use of recycled plastics or alternative products, depending on the design of the tax. For example, in the case of the UK plastic packaging tax, packaging that contains at least 30% recycled plastic is exempt from the tax.³⁵ This encourages a switch to greater use of recycled plastic packaging. Italy has introduced wider exemptions for recycled content and biodegradable and compostable plastics.

Other Member States may **increase extended producer responsibility (EPR)** fees to finance the contribution. For example, in Belgium it is anticipated that the cost of EU plastics contribution will be passed on to producers and users of plastic packaging via EPR compliance organisations.³⁶ These organisations would pay a higher fee to the Belgian government, which they would fund by increasing the EPR fees paid by their members. This approach may encourage producers and users of plastic packaging to shift towards alternatives because they face higher costs for plastic packaging. This only helps to drive a circular economy if the alternative option is more circular, such as reusable containers.

France, Germany, Ireland, Luxembourg and Slovakia have all announced that they **will pay the contribution from the state budget** and do not plan to pass on fees to businesses.³⁷ This approach is less likely to drive a circular economy because the contribution is financed by all tax-paying citizens rather than being targeted at the polluter, and so the incentive for behaviour change is weakened.

Most Member States do not yet have well developed plans for financing the EU plastics contribution. Poland and Sweden, for example, have announced that they will implement new legislation, but further details are not yet known.³⁸ EU-wide harmonisation of these plans is currently not planned and is unlikely.³⁹

Areas for Improvement

The EU Plastics Own Resource does not directly encourage **investment in recycling infrastructure** for plastic packaging. Since the contributions made by Member States are not earmarked for any particular purpose in the EU

³² European Commission (2021) Plastics own resource, accessed 13 July 2022, https://ec.europa.eu/info/strategy/eu-budget/long-term-eu-budget/2021-2027/revenue/own-resources/plastics-own-resource_en

³³ KPMG (2021) *Plastic Tax: Reduce, Reuse, Recycle*

³⁴ European Commission (2021) Plastics own resource, accessed 13 July 2022, https://ec.europa.eu/info/strategy/eu-budget/long-term-eu-budget/2021-2027/revenue/own-resources/plastics-own-resource_en

³⁵ HM Revenue and Customs (2022) *Check which packaging is subject to Plastic Packaging Tax*. <https://www.gov.uk/guidance/work-out-which-packaging-is-subject-to-plastic-packaging-tax>

³⁶ Van Doninck, S., and Sims, E. (2021) *How Belgium is implementing the EU plastics tax measures*, EY Belgium

³⁷ Valpak (2021) *EU Plastics Levy – countries not passing costs onto producers*, accessed 13 July 2022, <https://www.valpak.co.uk/eu-plastics-levy-countries-not-passing-costs-onto-producers/>

³⁸ EY (2021) *Plastics and packaging taxes in Europe: EY webcast summary*

³⁹ Guillen, M.P. (2021) *Spain will introduce for the first time a tax on single-use plastic*, WTS Global

budget, investment in recycling infrastructure is also not mandated through the EU budget. However, there is always a tension between implementing an environmental tax for the primary purpose of raising revenue as opposed to achieving a regulatory objective.

The EU Plastics Own Resource **limits its scope to plastic packaging** and does not address the need to reduce the growing amount of waste generated by packaging across other materials too.

The **design of instruments** used to finance Member States' plastics own resource contributions affects what behaviour change they incentivise. However, these design features must be carefully considered in order to avoid unintended consequences. For example, biodegradable and compostable packaging is exempt from the plastic tax in Italy, which could lead to a shift towards using more of this type of material where the environmental and carbon benefits are not apparent or clear-cut. Similarly, setting a threshold such as 30% recycled content for exemption in the UK Plastic Packaging tax case could limit the ambition of the plastic packaging producers and users to go beyond 30% recycled plastic, imposing a ceiling on the ambition.

The EU should play a role in both **revising and improving the Plastics Own Resource, to make it a stronger instrument for circularity**. A potential improvement could be to increase its scope to include other packaging materials too other than plastic packaging, or to have incentives in place to encourage investment in recycling infrastructure. These scope extensions would further drive circular behaviour, in this case, increased packaging recycling, which would contribute to decarbonisation and increase use of secondary raw materials. Applying such a measure to competing packaging materials could also ensure a level playing field whereby all materials used for packaging are faced with similar incentives. More broadly, such a measure could also be applied to other applications of these materials (beyond packaging) - this would provide a wider incentive for high levels of recycling.

Additionally, the EU can move to the ordinary legislative procedure requiring only qualified majority voting for setting tax policies at the EU level. This will make it easier to implement a common framework for circular taxation across the EU, and set a harmonised minimum rate of taxation for all Member States for plastic packaging similar to the minimum energy taxation rate set in the revised Energy Taxation Directive.

Table 2 Plastic taxes

Country	Policy	Scope	Rate	Who pays	(Expected) revenue	Stage of implementation
Spain ⁴⁰	Plastic packaging tax	Non-reusable plastic containers; semi-finished plastic products intended for production of non-reusable plastic containers; plastic products aimed to facilitate the closing, trading or presentation of the non-reusable containers.	EUR 0.45/kg of non-recycled plastic packaging.	Manufacturers of products used in Spain; those making intra-EU acquisitions of products used in Spain; the importer of products into Spain.	Expected revenue of EUR 724 million per year.	Approved and expected to enter into effect 1st January 2023.
Italy ⁴¹	Plastic packaging tax	Single-use plastic manufactured goods (<i>manufatti con singolo impiego</i> , "MACSI") composed totally or partially of organic polymers of synthetic origin which have (or are meant to have) the function of containment, protection, manipulation or delivery of goods or foodstuffs; items made of plastic materials, which allow closure (e.g., caps), the sale and the presentation (e.g., labels).	EUR 0.45/kg of plastic material contained in the MACSI.	The producer when the MACSI is produced and sold in Italy; the importer when the MACSI is imported from a non-EU country; the seller when the MACSI comes from another EU state and is sold to a private consumer.	Estimated (net) revenue just under 470 million for the year 2021 and euro 290 for 2022. ⁴²	Has faced a series of delays. Now expected to come into force in 2023.
UK ^{43,44}	Plastic packaging tax	Plastic packaging manufactured in, or imported into the UK, that does not contain at least 30% recycled plastic.	GBP 200/tonne of chargeable plastic packaging.	Any business that manufactures plastic packaging in the UK or imports plastic packaging or products contained in plastic packaging into the UK.	Expected revenue of GBP 235 million per year, for the first two years.	Came into force on 1st April 2022.

⁴⁰ EY (2022) *Spain introduces new indirect tax on non-reusable plastic packaging as of 1 January 2023*

⁴¹ Scuderi, E. (2021) *Towards a Plastic-Free Economy: The Italian Plastic Tax*, *Rivista di Diritto Tributario*

⁴² Dossier 2020 Italian Budget Law, Profili finanziari - A.C.2305, p.437, available at <https://www.rivistadirittotributario.it/2021/04/07/towards-a-plastic-free-economy-the-italian-plastic-tax/>

⁴³ PwC (2021) UK Plastic Packaging Tax - are you ready?, accessed 13 July 2022, <https://www.pwc.co.uk/services/tax/insights/uk-plastic-packaging-tax-are-you-ready.html>

⁴⁴ HM Revenue and Customs (2021) *Introduction of Plastic Packaging Tax from April 2022*

3.1.2 Product Tax - Vehicles

Reason for selection: Automotive vehicles were chosen as the product tax case study because they are products that are **material intensive**, and therefore the gains from reducing their environmental impact are potentially very significant. They also **have high residual value with great potential for circulation loops** (established second hand markets, great reuse potential before reaching end-of-life), and there are **increasing examples of use models** alternative to purchasing new. Additionally, the introduction of circular taxes for vehicles can **complement and reinforce some of the existing environmental taxes** and incentives already in place (e.g. for fuel). Furthermore, electrification of vehicles will bring its own challenges, which will need to be addressed. Taxes on vehicles have proven unpopular so it will be important to ensure citizens participation and communication to improve public support.

In Europe, the national vehicle taxation systems vary by country, both in terms of taxation components in place (purchase subsidies, registration taxes, annual ownership taxes,) and of the parameters determining the tax burden (fuel type, CO₂, engine power, vehicle list price, etc)⁴⁵. This case study discusses the various vehicle taxes in place across European countries, discussing vehicle registration tax, fuel duties, and road user charging, then discusses new concepts such as a weight tax and shared automobility, and finally potential areas for improvement.

Vehicle registration tax

Vehicle registration tax is a tax levied on every vehicle using public roads, charged when the vehicle is first registered. The tax rate varies by European country. In Germany, there is no registration tax (there is only an overall registration fee of about €26.30 depending on the city). In the Netherlands, the registration tax is determined by the car's CO₂ emissions, and it is not charged for battery electric vehicles (BEV). In Italy, vehicle taxation is dependent on engine power.⁴⁶ In the UK, first-year registration payments are related to CO₂ emissions, so that the more CO₂ a car emits, the greater the amount payable. For instance, drivers of relatively fuel-efficient petrol or diesel cars (up to 50g/km CO₂) would typically pay up to £25 for the year when they first register the vehicle, depending on the car's official CO₂ emissions, whereas drivers of less fuel-efficient cars would pay more, up to a maximum of £2,365 for the year.⁴⁷ The aim of charging differential rates according to the amount of CO₂ emissions the vehicle emits is to encourage the purchase of less environmentally damaging vehicles that impose a lower social and environment cost on society.

Most European nations offer some form of reduced registration tax for electric vehicles (e.g. Belgium, Spain, Denmark), with rates varying according to the type of electric vehicle. This acts as an incentive to encourage their purchase and use. The Netherlands, for examples, goes further and charges no registration tax for BEVs,⁴⁸ and as of 2020, Belgium does the same for zero-emission vehicles.⁴⁹

Fuel duty

Fuel duties are levied on purchases of petrol, diesel and a variety of other fuels, and the rate depends on the type of fuel. To facilitate and foster cross-border trade and to prevent significant competitive distortions, the European Union requires Member States to levy a minimum fuel duty of €0.36 per litre of gasoline. The current EU rules for taxing

⁴⁵ Hauff, K et al. (2018) 'Taxation of Electric Vehicles in Europe: A Methodology for Comparison', MDPI. Available at: <https://www.mdpi.com/2032-6653/9/2/30/pdf>

⁴⁶ Ibid

⁴⁷ Office for Budget Responsibility (2022) *Vehicle excise duty*. Available at: <https://obr.uk/forecasts-in-depth/tax-by-tax-spend-by-spend/vehicle-excise-duty/>

⁴⁸ Ibid.

⁴⁹ ACEA (2020) *ELECTRIC VEHICLES: TAX BENEFITS & PURCHASE INCENTIVES*. Available at: https://www.acea.auto/files/Electric_vehicles-Tax_benefits_purchase_incentives_European_Union_2020.pdf

energy products (and electricity) are laid down in the Energy Tax Directive 2003/96/EC⁵⁰ and are currently being revised. The Netherlands has the highest gasoline tax in the European Union, at €0.81 per litre, and Italy has the second highest, at €0.73 per litre. The lowest gasoline taxes are in Hungary, at €0.34 per litre, and Bulgaria, at €0.36 per litre. Many European consumers face excise duties on diesel instead of gasoline. The EU sets a slightly lower minimum excise duty of €0.33 per litre on diesel.⁵¹ Imposing a tax on fuel makes driving fuel consuming (i.e. Internal Combustion Engine) vehicles more expensive, and therefore incentivizes a reduction in driving those types of vehicles. In the UK, for example, fuel duty is not currently levied on electric vehicles, as an incentive to encourage their purchase and their use.

Weight tax

In 2020, the French government announced the introduction of a new car weight tax designed to encourage manufacturers to reduce CO₂ emissions and penalise those vehicles that use more materials and more energy. The new tax would see cars weighing more than 1,800kg (SUVs) taxed at a rate of €10 for every additional kilogram of weight but would not apply to electric cars.⁵² This is a good example of a circular tax as it targets products that have used more materials in their production and therefore have a higher material and environmental footprint.

Road user charging

Road user charging (also called congestion charging or road pricing) involves charging drivers for the use of roads they drive on. It is designed to charge road users for the additional costs which their use of road space imposes on the rest of society, therefore creating an incentive to drive less, and with it reduce congestion, air pollution and noise pollution.

The charge can vary according to location (congestion is worse in the city centre so the charge should be higher), time of day (congestion is worse at peak hours so the charge should be higher then) and type of vehicle (larger and more polluting vehicles cause more damage so should face higher charges). From an environmental perspective, differentiating the charge by vehicle weight is also beneficial, as this acts as a proxy for energy use. For road user charging to have its desired effect of getting people out of cars and into public transport and active modes of travel, the price incentive must be high enough. Road user charging can take the following forms:

- **Area licensing schemes (ALS):** Vehicles using the roads within a designated area (and designated time) pay a licence fee, usually related to vehicle type. The Singapore ALS (from 1975 to the late 1990s) was an early example. The congestion charging scheme in central London applies the same principle.
- **Cordon pricing (or 'toll rings'):** Charging points are located at all entries to a given area (often a city centre), usually with higher charges for large or polluting vehicles and at more congested times of day. Oslo has been operating a toll ring since 1990, and the Stockholm scheme also uses a cordon.
- **Continuous charging systems:** These charge vehicles for all travel within a defined area (such as a city). The charge can be based on distance travelled or time spent travelling, or can involve a charging point on every road link. The complexity means that fully automatic electronic charging ('electronic road pricing' or ERP) must be used. Singapore is using an ERP system, which is not yet a truly continuous system, but may become one in the future.⁵³

⁵⁰ European Union (2003) COUNCIL DIRECTIVE 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity. Available at: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:283:0051:0070:EN:PDF>

⁵¹ Tax Foundation (2021) *Gas Taxes in Europe*. Available at: <https://taxfoundation.org/gas-taxes-in-europe/>

⁵² Auto Express (2020) *SUVs targeted by new weight tax in France*. Available at: <https://www.autoexpress.co.uk/news/353518/suvs-targeted-new-weight-tax-france>

⁵³ Institute for Transport Studies, University of Leeds (2022) *Road user charging*. Available at: http://www.its.leeds.ac.uk/projects/konsult/private/level2/instruments/instrument050/l2_001summ.htm

Road user charging can reduce traffic levels in the affected area, typically by 15% to 20%, with more substantial reductions in congestion.⁵⁴ The Singapore ALS led to 19% of drivers travelling to the city centre switching to bus, 17% switching to car sharing to take advantage of the exemption for cars with four or more people, and a reduction of 44% of traffic entering the centre.

Key issues with road charging are its acceptability to drivers (and to others who may be affected by it, e.g. businesses within the charged area), the type and complexity of the chosen technology (manual, video-based, fully electronic) and enforcement.

Shared automobility

Cars have traditionally been associated with very low utilisation rates: a report by the RAC Foundation found that the typical UK car is parked 96.5% of the time (it is on the move for 6 hours in a 168 hour week), meaning it has a utilisation rate of just 3.5%.⁵⁵ Increasing the utilisation rate of cars will mean fewer cars will need to be manufactured in the first place, as more people can use a fewer number of cars. This will mean fewer resources (metal and other) required to be extracted, improving circularity as a result. Furthermore, according to national surveys, the occupancy rates (the average number of passengers in a vehicle) of passenger cars are falling steadily, mostly as a result of the continued drop in household size and increases in car ownership⁵⁶. This equates to more resources used per person, or fewer people using a higher number of resources.

Cars are also very expensive products to purchase and as a result many individuals cannot afford them and are priced out of owning a car outright. The rise of the sharing economy has enabled new forms of urban mobility that were previously either non-existent, small scale and informal in nature, and has improved affordability and access to mobility as well as increase the utilisation rate of cars. These new modes, collectively referred to as shared automobility, rely upon digital platforms that facilitate transactions as part of the sharing economy and the related product-service economy, on-demand economy, and second-hand economy.⁵⁷ Some of these are laid out below:

Car sharing: Car sharing reduces the number of cars on the road by enabling different users to use the same car and extends the benefits of automobility to individuals without them having to bear the cost and effort of car ownership. The car sharing market has grown significantly in recent years – the number of individuals participating in European car sharing schemes increased from 200,000 in 2006, to an estimated 2.2 million in 2014, 5.1 million in 2016 and 11.5 million in 2018.⁵⁸ The following are some of the car sharing business models in existence:⁵⁹

- **Free-floating car sharing (B2C)** allows customers to pick up and return the vehicle anywhere within a certain area. It provides higher flexibility and is mainly used for short one-way trips, therefore competing with taxis and new mobility providers such as Uber. German providers have a high turnover rate of 125 users/car, evidencing the degree to which car sharing is actually taking place.⁶⁰
- **Stationary car sharing (B2C)** relies on fixed stations and usually provides only round trips with the start and end points being the same. The use case is therefore more for longer drives and tends to substitute rental cars or car ownership. Utilization is higher than free-floating car sharing due to longer drives.

⁵⁴ Ibid

⁵⁵ RAC Foundation (2012) Spaced Out Perspectives on parking policy. Available at: https://www.racfoundation.org/wp-content/uploads/2017/11/spaced_out-bates_leibling-jul12.pdf

⁵⁶ EEA (2020) *Occupancy Rates*. Available at: <https://www.eea.europa.eu/publications/ENVISSUENo12/page029.html>

⁵⁷ George, C and Julsrud, T.E. (2019) 'Chapter Two - Cars and the sharing economy: The emergence and impacts of shared automobility in the urban environment', *Advances in Transport Policy and Planning*, vol. 4, pp. 7-38. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S2543000919300125>

⁵⁸ JRC (2022) *Research and innovation in car sharing in Europe*. Available at: <https://publications.jrc.ec.europa.eu/repository/handle/JRC127774>

⁵⁹ Deloitte (2017) *Car Sharing in Europe*. Available at: <https://www2.deloitte.com/content/dam/Deloitte/de/Documents/consumer-industrial-products/CIP-Automotive-Car-Sharing-in-Europe.pdf>

⁶⁰ Ibid

- **B2B car sharing** is managed as a closed system in which employees can access vehicles on a sharing basis, so is an alternative for corporates to operating their own fleet.
- **Peer-to-peer (P2P)** car sharing is a model where individuals provide their own car for rental by private users via a platform. Pricing is based on a daily tariff and provides a good alternative to stationary car sharing or rental cars.

Ride-sharing: Ride-sharing (also known as car-pooling) is the sharing of car journeys so that more than one person travels in a car, and prevents the need for others to have to drive to a location themselves.

Impacts: Ride-sharing and shared automobility generally leads to reduced automobile use, saving on fuel and toll costs, reduced carbon emissions and reduced vehicle collisions.

One recommendation is to integrate ride-sharing services with public transport in locations where access to public transport is limited or frequency is low. Research showed that in these locations the likelihood to use ride-sharing services increases.⁶¹ In this way ride-sharing services should be partially subsidised to transfer travellers to public transport hubs. Another recommendation is to add ride-sharing and car-sharing to the list of modalities that are eligible for tax benefits. Incentives and subsidies should take into consideration the ride-sharing impacts to avoid under-subsidizing public transport modes or modes that generate less emissions (i.e., bike and micromobility).⁶²

Common Areas for Improvement

Many of the vehicle taxes to date, such as vehicle excise duty and fuel duties, have focused on taxing fuel use and the associated environmental damage caused by emissions. Though taxing fossil fuel use should encourage a shift towards electric and low emission vehicles, **truly circular taxes should move beyond the concept of internalising environmental costs and instead encourage low material use, reuse, repair,** and reduction in use of hazardous materials and components that prevent materials from being circular (and being reused). An electric car battery is composed mainly of metals in the active part of the cell – some of these metals are now becoming scarce (copper, cobalt, nickel, manganese, aluminium, lithium, etc); batteries also contain pollutants that may present a danger to the environment and human health. Therefore, though the increase in the share of electric vehicles should reduce the environmental costs caused by tailpipe emissions, it could also lead to an increase in other pollutants, and they will not reduce overall material footprints and use of hazardous materials unless these components are taxed too. Circular taxes on vehicles should therefore also **aim at individual vehicle components, the overall quantity of material used to produce a vehicle,** and higher tax rates should be envisaged for vehicles with heavier batteries that use more material and cause more road wear, and tax batteries on the amount of hazardous components they contain.

Raccuja's "Paying for road use could be Miles Better" paper argues for a road and **vehicle tax system that charges vehicles, amongst other things, based on their weight,** given that the heavier a vehicle is, the higher its impact on the road surface.⁶³ Raccuja argues that the lighter your vehicle is, the lower the per mile charge. The system will boost investment and update the way we run roads ready for a new generation of electric and autonomous vehicles.

Importantly, if a consistent signal is to be given to manufacturers, there is a strong argument for harmonising *at least* the basis of vehicle taxation by Member State, and potentially the minimum level of taxation. A recent comprehensive review of car taxation in Europe by Transport & Environment highlights the full range of different approaches.⁶⁴ If, for

⁶¹ Mitropoulos, L. et al (2021) 'A systematic literature review of ride-sharing platforms, user factors and barriers', *European Transport Research Review*. Available at: <https://etr.springeropen.com/articles/10.1186/s12544-021-00522-1>

⁶² Ibid

⁶³ Raccuja, G (2017) *Miles Better A distance-based charge to replace Fuel Duty and VED, collected by insurers*. Available at: <https://policyexchange.org.uk/wp-content/uploads/2017/07/Gergely-Raccuja-Miles-Better-Revised-Submission.pdf>

⁶⁴ Transport & Environment (2022) *The Good Tax Guide: A comparison of car taxation in Europe*, October 2022, available at <https://www.transportenvironment.org/discover/the-good-tax-guide/>

example, there were a harmonised approach to tax on vehicle weight, as we transition to electric vehicles, this would provide a strong steer to manufacturers to work on developing lighter vehicles.

In summary, circular taxes on vehicles should complement energy related taxes which mainly focuses on internalising external costs of GHG emissions, in order to further incentivise low material uses and circular business models through taxes based on vehicle weight, number of miles driven, overall quantity of material used to produce the vehicle, amount of hazardous materials contained in their batteries, etc. Circular taxation applied to vehicles could help shift our behaviour in relation to car purchasing and ownership, and contribute to key societal objectives such as reduction of traffic, cleaner air, decarbonisation of the economy and reduced dependency on critical raw materials. Importantly, it is not enough to simply replace internal combustion engine vehicles with EVs; we need to reduce the number of private vehicles in use, encourage significant modal shift to active travel and public transport and where vehicles are needed, to increase the intensity of use of those vehicles through sharing models. Circular taxation on its own may not be able to bring about such a shift in its entirety but, working in parallel with supporting policy measures, it can make a significant contribution to such a transition.

3.1.3 Relief Tax – VAT Reduction on Repair

Reason for selection: Several Member States, such as Belgium and the Netherlands, have reduced VAT (Value Added Tax) for repair services and/or implemented tax deductions for repair activities. The Swedish case has been selected due to the **wide coverage of products:** shoes, bicycles, IT equipment and white goods.

Design and Implementation

VAT (Value Added Tax) is considered a consumption tax. This means the burden of VAT is carried forward through the production and distribution stages of the product's supply chain and the consumer is the 'liable person' to pay it.⁶⁵ Repair is a labour-intensive activity. The VAT reduction on repair aims to increase the availability of repair services, make repair more accessible and affordable to consumers, and incentivise them to choose repair over purchasing newly made goods.⁶⁶ This extends the lifetime of the product and is in line with the waste hierarchy which prioritises repair and reuse.⁶⁷

The VAT reduction on repair is a part of the Swedish tax law regarding VAT (Mervärdesskattelagen (1994:200)).⁶⁸ Small repair services, for example for products such as textiles, shoes, leather products and bicycles, are subject to a tax relief, with VAT being reduced from 25% to 12%.⁶⁹ The VAT reduction is applied upon purchasing of the repair service. The cost of the VAT reduction is estimated to be \$54 million annually in lost taxes.⁷⁰ IT equipment and white goods are also subject to a 50% tax relief for the labours costs when the repair is done at home.

⁶⁵ Rendahl, P. (2016) The Functionality of VAT: A Swedish Perspective. *Intertax*, 44(4).

⁶⁶ Milios, L. (2021) Towards a circular economy taxation framework: Expectations and challenges of implementation. *Circular Economy and Sustainability*, 1(2), pp.477-498.

⁶⁷ DG Environment (2022) *Waste Prevention and Management*, accessed 7 July 2022, https://ec.europa.eu/environment/green-growth/waste-prevention-and-management/index_en.htm

⁶⁸ Sveriges Riksdag. (2022) accessed 8 July 2022, https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/mervardesskattelag-1994200_sfs-1994-200

⁶⁹ Almén, J., Anehagen, M., Enström, E., Hartman, C., Jonsson, C., Lindblad, F. and Ohlsson, J. (2020) *Promoting the repair sector in Sweden*, accessed 7 July 2022, https://lucris.lub.lu.se/ws/portalfiles/portal/77933910/Promoting_the_repair_sector_in_Sweden_2020_IIIEE.pdf

⁷⁰ Starritt, A. (2016) *Sweden is paying people to fix their belongings instead of throwing them away*, accessed 7 July 2022, <https://www.weforum.org/agenda/2016/10/sweden-is-tackling-its-throwaway-culture-with-tax-breaks-on-repairs-will-it-work/>

Impacts

There have been few studies done on the impacts of the VAT reduction. Nevertheless, it is expected that a significant increase in the repair of products would reduce resource use and the corresponding environmental impacts such as water pollution and carbon emissions.⁷¹

A qualitative analysis interviewed businesses after the implementation of this VAT reduction on repair in Sweden. The study found that only 9 interviewees out of 22 noticed an increase in the number of repairs executed since the tax implementation in 2017.⁷² Bicycle repairs were marginally more likely to perceive an effectiveness of the tax relief compared to shoe repairs, likely due to bicycles being more expensive than shoes on average to buy new and the influence of ever-changing fashion trends.⁷³ Most businesses were not able to determine whether VAT reduction was the cause of the increase in repair, and some reasoned the high purchasing price of new products was likely a more significant factor than the reduced tax. A study analysing the impact of VAT reduction on consumer choice to repair would be helpful. One such study which analysed a different VAT reduction in Sweden concluded that the VAT reduction had increased the consumer footfall of the businesses eligible for the tax relief.⁷⁴

Another potential impact of the VAT reduction is job creation. The EU's VAT Directive (2006/112/EC) lists requirements for activities eligible for VAT reduction. These are that the activities should be supplied by organisations engaged in welfare or social security work, labour-intensive, provided direct to final consumers; and, local.⁷⁵ Although there have been no studies on the social benefits of the relatively new VAT reduction for repair in Sweden, a similar scheme in Flanders, Belgium saw a network of 162 re-use shops provide employment and vocational training for 5,828 low-skilled, long-term unemployed citizens.⁷⁶

Areas for Improvement

The scope of the Swedish VAT reduction is relatively large, but is still limited to certain sectors, or, in the case of IT equipment and white goods, is only applied to repairs at home. NGO RREUSE, an international network representing social enterprises active in re-use, repair and recycling, calls for the inclusion of more sectors, such as furniture, all electric and electronic equipment (EEE) and/or construction materials, as well as the cost of labour of the repairs.⁷⁷ The interviewees in the Swedish white goods sector asked for the tax relief to also apply to spare parts and the transport to the customer location.⁷⁸ Expanding the scope of this policy would have a greater effect on the number of products which get repaired, as well as on the resulting reduction in resource use and associated environmental impacts.

Many sectors eligible for this tax relief work with products which are cheap and easy to find, especially textiles and shoes from fast fashion. This may reduce the consumer desire to repair these products, even with a VAT reduction. The price of the item was perceived to have more effect on the likelihood of repair; in both the bicycles and white

⁷¹ Ellen MacArthur Foundation. (2021) *Financing the Circular Economy*, accessed 8 July 2022, <https://ellenmacarthurfoundation.org/financing-the-circular-economy-capturing-the-opportunity>

⁷² Almén, J., Anehagen, M., Enström, E., Hartman, C., Jonsson, C., Lindblad, F. and Ohlsson, J. (2020) *Promoting the repair sector in Sweden*, accessed 7 July 2022, https://lucris.lub.lu.se/ws/portalfiles/portal/77933910/Promoting_the_repair_sector_in_Sweden_2020_IIIEE.pdf

⁷³ It is important to note the sample size of this study was small and that the VAT reduction had only been implemented for a relatively short time (3 years)

⁷⁴ Falkenhall, B., Månsson, J. and Tano, S. (2020) Impact of VAT reform on Swedish restaurants: a synthetic control group approach. *The Scandinavian Journal of Economics*, 122(2), pp.824-850.

⁷⁵ Council Directive 2006/112/EC of 28 November 2006 on the Common System of Value Added Tax, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:347:0001:0118:en:PDF>

⁷⁶ Reuse. (2021) *Job Creation in the Re-use Sector: Data Insights from Social Enterprises*, accessed 8 July 2022, <https://www.rreuse.org/wp-content/uploads/04-2021-job-creation-briefing.pdf>

⁷⁷ Reuse (2017) *Reduced taxation to support re-use and repair*, accessed 8 July 2022, https://www.rreuse.org/wp-content/uploads/RREUSE-position-on-VAT-2017-Final-website_1.pdf

⁷⁸ Almén, J., Anehagen, M., Enström, E., Hartman, C., Jonsson, C., Lindblad, F. and Ohlsson, J. (2020) *Promoting the repair sector in Sweden*, accessed 7 July 2022, https://lucris.lub.lu.se/ws/portalfiles/portal/77933910/Promoting_the_repair_sector_in_Sweden_2020_IIIEE.pdf

goods sectors “*the higher the purchasing price, the higher the willingness to repair*”.⁷⁹ The effectiveness of the VAT reduction on repair could be increased by implementing other forms of taxation or regulation on products manufactured with large resource use and products which have low reuse and repair potential. This would make the difference in the price of repair versus buying new products significant enough to alter consumer choice, which is a point which should be communicated.

Another area for improvement is communicating the benefits of the tax reduction. A 2019 Swedish Environmental Agency (Naturvårdsverket) survey found that 93% of respondents would support repairing their clothes and textiles if they knew it had a positive effect on the environment.⁸⁰ Targeted communication campaigns surrounding the positive environmental impact of repair would increase consumer engagement and build long-lasting public support for the tax relief. Communication campaigns could also focus on providing information about the VAT reduction, as lack of information about the tax relief was provided as a reason businesses thought they were not seeing an increase in repair.⁸¹ This could include how the VAT reduction works, which products are eligible and how and where to access it.

3.1.4 Waste Tax – UK Landfill Tax

Reason for selection: The UK landfill tax was selected as a case study because it is a **well-known best practice** and multiple European countries have based their landfill tax off the UK’s design. The rationale for the tax is **clearly defined** as encouraging a circular economy shift rather than simply internalising the environmental impacts from landfilling.

Beyond environmental taxation

The landfill tax can be used to internalise the external costs of landfilling. This means that the harmful effects of landfilling are accounted for in the price. This can be done by setting the tax rate to equate these external costs. However, the external costs of landfilling are often lower than the cost of recycling. In order to successfully divert waste from landfill to recycling, the landfill tax needs to be set at a level that will make recycling the preferred option from a financial perspective. An aim of a landfill tax can be to provide funding for recycling infrastructure and environmental bodies to reduce the amount of waste sent to landfill and mitigate the environmental impacts of landfilling. One of the best practices of landfill tax being utilised as a mechanism of circular taxation is in the UK.

UK Landfill Tax Design

The UK landfill tax was introduced in 1996 and the initial tax level was based on reflecting the externalities associated with landfill. In 2005 a Tax Escalator was introduced in order to increase the effectiveness of the tax in landfill diversion by incentivising recycling. The tax level has been steadily increasing since then - the table below shows the most recent tax rates.⁸²

⁷⁹ Ibid.

⁸⁰ Naturvårdsverket. (2019) Rapport: Hållbara textilier - Konsumentundersökning 2019. Stockholm:Naturvårdsverket. <https://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/miljoarbete-i-sverige/regeringsuppdrag/2018/konsumentundersokning-webbpanel-2019.pdf>

⁸¹ Milios, L. (2021) Towards a circular economy taxation framework: Expectations and challenges of implementation. *Circular Economy and Sustainability*, 1(2), pp.477-498.

⁸²CEWEP (2021), Landfill taxes and restrictions, available at <https://www.cewep.eu/wp-content/uploads/2021/10/Landfill-taxes-and-restrictions-overview.pdf>

Table 3 UK Landfill Tax Rates

	from 1 st April 2020 to 31 st March 2021	from 1 st April 2021 to 31 st March 2022
Standard Rate	£94.15/t	£96.70/t
Lower Rate ⁸³	£3.00/t	£3.10/t

As shown in Table 3 UK Landfill Tax Rates, there are two differential tax rates under the landfill tax in the UK. The lower rate applies to non-hazardous waste streams with low potential for greenhouse gas emissions and low polluting potential in the landfill environment, whilst the higher tax rate applies to hazardous waste streams (2011 Order). The rates are adjusted yearly for inflation and cannot fall below £80/t for the standard rate.

UK's landfill tax was designed to be revenue-neutral by offsetting a reduction in National Insurance Contributions, but since 2003, most of the revenue goes to the government's general budget.⁸⁴ In addition to revenue going to the general budget, some of it is allocated to an innovative scheme that was developed to enable the use of some revenue for environmentally and socially beneficial projects such as closing down unauthorised landfill sites and creating jobs in other areas of waste management.

Part of the revenue from the tax is also used for investment in related environmental bodies where about 10% of the total revenue has been channelled to the Landfill Communities Fund to finance environmental regeneration projects and promote biodiversity.⁸⁵ The Landfill Communities Fund has four objectives which include:⁸⁶

- The reclamation, remediation or restoration of land which cannot currently be used;
- The prevention of potential for pollution or the remediation of the effects of pollution;
- The provision, maintenance or improvement of a public park or another public amenity; and
- The conservation or promotion of biodiversity.

The earmarking of landfill tax revenue has enabled the UK to further promote environmental conservation and regeneration which has assisted the UK in holding to their Biodiversity Action Plan.

Tax impacts

The revenue raised from the landfill tax was around €277 million in 1997/98 and this rose steadily to a peak of around €1.02 billion in 2013/14 but has since dropped to around €667 billion in 2021/22.⁸⁷ The variation in revenues is a result of initially increasing rates of taxation, leading to the peak in 2013/14, and then due to the reduction in the amount of waste landfilled, leading to the more recent decline.⁸⁸

The tax had environmentally positive outcomes with the weight of wastes being sent to licensed landfill sites falling over time combined with the rate of recycling increasing.⁸⁹ The increase in cost from the landfill tax incentivises recycling because the local authorities paying an increase in gate fee to use the landfill which will then present recycling as being more financially favourable. This provides evidence that the landfill tax is promoting a circular economy by increasing the amount of waste recycled and encouraging the reuse of products as well as enabling

⁸³ The lower rate applies to non-hazardous waste streams with low potential for greenhouse gas emissions and low polluting potential in the landfill environment (2011 Order).

⁸⁴ IEEP (2016). Landfill Tax in the United Kingdom. <https://ieep.eu/uploads/articles/attachments/e48ad1c2-dfe4-42a9-b51c-8fa8f6c30b1e/UK%20Landfill%20Tax%20final.pdf?v=63680923242>

⁸⁵ IEEP (2016). Landfill Tax in the United Kingdom. <https://ieep.eu/uploads/articles/attachments/e48ad1c2-dfe4-42a9-b51c-8fa8f6c30b1e/UK%20Landfill%20Tax%20final.pdf?v=63680923242>

⁸⁶ ENTRUST (2022). Landfill Communities Fund Projects. <https://www.entrust.org.uk/projects/>

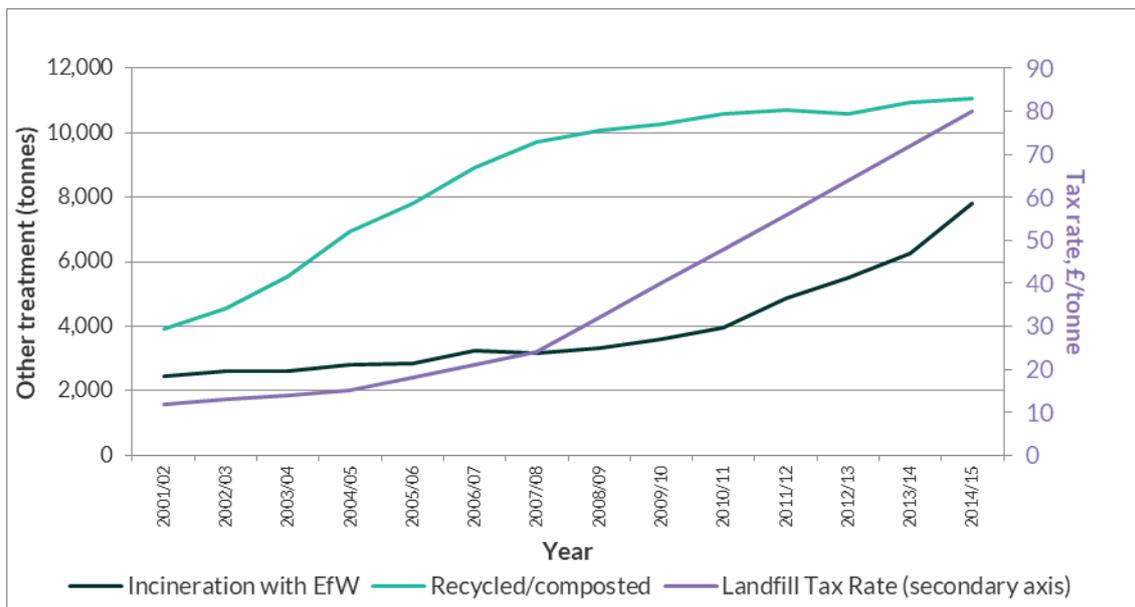
⁸⁷ HMRC (2016). Landfill Tax (LFT) Bulletin - April 2016: Historic Receipts and Liabilities Declared.

⁸⁸ IEEP (2016). Landfill Tax in the United Kingdom. <https://ieep.eu/uploads/articles/attachments/e48ad1c2-dfe4-42a9-b51c-8fa8f6c30b1e/UK%20Landfill%20Tax%20final.pdf?v=63680923242>

⁸⁹ European Commission (2001). Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the European Union and its Member States https://ec.europa.eu/environment/enveco/taxation/pdf/ch10_landfill.pdf

remanufacturing of products from recycled goods. The figure below displays the increase in landfill tax coupled with the increase in recycling/composting and incineration from 2001 to 2015.⁹⁰

Figure 6 UK Landfill Tax Rate and Waste Recycled or Incinerated



There have been three other impacts⁹¹ of the tax in the context of employment generation that are worth mentioning. The first is the fact that several companies have begun to employ waste minimisation officers, partly or wholly as a response to a higher waste disposal cost due to the introduction of the tax. The second is that the tax has had an impact on the recycling of waste, and recycling tends to be more employment-intensive in the sorting and collection phases which will increase employment. Thirdly, various projects are carried out utilising the tax revenue which results in job creation through the various projects. Therefore, employment generation has, and continues to, occur.

Perverse impacts and areas of improvement

Although the tax has had positive impacts on the environment and employment generation, it also has design flaws which result in perverse impacts, for example the exemptions⁹² from paying the tax. The number of exemptions enables the misclassification of waste at authorised landfill sites for the financial gain of the landfill site operator. There is also an incentive for misclassification due to the dual tax rates. The misclassification of general and inert waste has been estimated to cost the government £120 million of lost tax revenue in England in 2018/19.⁹³ Similarly, the yearly increase in the landfill tax results in waste crimes such as fly-tipping, illegal waste sites, exemption breaches, illegal exports and waste fires in attempt to avoid paying the tax. The estimated total cost of waste crime in England was £924 million in 2018/19 which is not all attributed to the landfill tax.⁹⁴

It has been discussed in previous reports published by Eunomia^{95, 96} that there is insufficient enforcement and compliance with the landfill tax. The lack of compliance is suggested as an outcome to enforcement fines being too low

⁹⁰ Department of Environment, Food and Rural Affairs (2022). UK Statistics on Waste. <https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste#:~:text=In%202020%2C%208.4%20million%20tonnes,as%20'mixed%20municipal%20waste>

⁹¹ European Commission (2001). Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the European Union and its Member States, available at: https://ec.europa.eu/environment/enveco/taxation/pdf/ch10_landfill.pdf

⁹² <https://www.gov.uk/government/publications/excise-notice-ift1-a-general-guide-to-landfill-tax/excise-notice-ift1-a-general-guide-to-landfill-tax#exemptions>

⁹³ Eunomia Research and Consulting (2021). Counting the Cost of UK Waste Crime Report 2021: <https://www.eunomia.co.uk/reports-tools/counting-the-cost-of-uk-waste-crime/>

⁹⁴ Ibid.

⁹⁵ Ibid.

⁹⁶ Eunomia Research and Consulting (2014). Waste Crime: Tackling Britain's Dirty Secret. <https://www.eunomia.co.uk/reports-tools/waste-crime-tackling-britains-dirty-secret/>

in comparison to the tax. Additionally, the Environment Agency, who is responsible for enforcing the tax in England, requires increased funding to robustly monitor and enforce the tax. It has also been suggested in previous reports that part of the revenue earned from the landfill tax should be ring-fenced to be spent on monitoring and enforcement of the tax as well as invest in the waste management system.

In addition, the implementation of the landfill tax has not been accompanied by an incineration tax. The lack of an incineration tax incentivises the switch from landfill to incineration instead of the shift from landfill to recycling (due to incineration being cheaper than recycling). As shown in Figure 6, the amount of waste incinerated is increasing along with the increase in landfill tax. The switch from landfill to incineration is environmentally harmful due to the pollutants released from incineration plants into the air and the resources which are lost rather than recirculated through recycling. If an incineration tax was implemented accompanying the landfill tax, it would be expected to see an even higher increase in recycling thus maximising the circularity gains.

In summary, to make the landfill tax more circular, the tax rate needs to go beyond internalising the external costs of landfilling to reflect cost of the more circular alternative – recycling. Moreover, the landfill tax will need to be accompanied by an incineration tax to equate the cost of incineration to the cost of recycling, so that waste does not get diverted to incineration instead of recycling. Finally, to incentivise consumers to recycle more, a Pay-As-You-Throw (PAYT) scheme could be implemented, and the revenue can be used to fund development of the required collection and recycling infrastructure to support a more circular economy.

3.1.5 Summary of Case Studies

Table 4 Summary of case studies

Case study	Tax type	Tax design	Implementation framework	Positive impacts	Barriers and challenges
EU Plastics Own Resource	Resource (indirectly) & end-of life	Contribution made by each Member State to the EU budget. Rate of EUR 0.8 per kilogram of plastic packaging waste that is not recycled Includes mechanism to limit burden on less wealthy Member States	Member States decide how (and if) to apply the plastics own resource domestically. Some Member States will introduce plastics taxes to finance the contribution, some will increase EPR fees, and some will pay the contribution directly from the general state budget without passing on fees to businesses	Could generate EUR 6 - 8 billion of additional revenue annually for the EU budget Should incentivise recycling of plastic packaging, and, depending on tax design, could encourage design changes to increase recyclability of packaging and/or shift producers and users away from single-use plastic packaging towards reusables	Circular economy benefits will depend largely on how (and whether), Member States choose to implement the plastics own resource nationally. If the contribution is paid from the Member State's budget with no fee passed through to polluters, then the 'polluter pays principle' is not applied
Economic incentives on cars	Product	Different taxes applied at different stages of the product lifecycle, for example, vehicle excise duty at the point of purchase, road user charging and fuel taxes during product use	A variety of instruments and business models can affect the economic incentives on cars, at different stages in the product lifecycle. For example, vehicle excise duty, fuel taxes/duties, road user charging, car-sharing and ride-sharing	Reduction in use of materials, reduced automobile use, carbon emissions, air pollution, noise pollution, congestion and vehicle collisions	May require new monitoring and fee collection infrastructure Difficulties associated with using new systems and technologies for consumers
VAT reduction on repair Sweden	Tax relief	<ul style="list-style-type: none"> VAT reduced from 25% to 12% on small repair services 50% tax relief on labour for at home repair of white goods and IT equipment \$54 million annually in lost taxes 	Some evidence that the scheme has not resulted in a significant increase in repairs but lack of consensus Narrow product scope	Expected to reduce resource use and the corresponding environmental impacts and create jobs	Replacement products are cheap and easily accessible, which reduces effectiveness of VAT reduction on repair Lack of public awareness of the scheme Lack of evidence of positive impacts

Case study	Tax type	Tax design	Implementation framework	Positive impacts	Barriers and challenges
UK landfill tax	Waste	Tax rate designed to achieve recycling equivalence Excessive exemptions Tax escalator	Harmonisation across UK market prevents waste diversion Enforcement and compliance challenges	~ EUR 1.1 billion raised, increased recycling and employment creation	Creation of lucrative illegal market Lack of enforcement and compliance

3.2 Current Situation - Barriers and Challenges to be Overcome

The four case studies presented in Section 3.1 highlight some of the key successes and positive impacts of circular taxes, but also present some key barriers and challenges that have been faced when implementing them, and which will need to be overcome. This section draws from the lessons learnt from the case studies to provide an overview of barriers and challenges. It is important to note that many of the barriers and challenges outlined in this section apply to most, if not all, types of taxes, not just circular taxes. Section 4.0 then sets out recommendations for designing and implementing circular taxes in such a way that these barriers can be overcome.

There are four main actors affected by the identified barriers and challenges when deploying circular taxation: implementing government bodies, government tax collection bodies, consumers and producers.

Government Bodies

Data requirements for effective tax design. Setting the rate of a tax at a level that sends the right price signal to encourage the desired changes in behaviour is a challenge in the design of most behavioural taxes, including circular taxes. It may be difficult to know in advance the required tax rate to drive the expected changes. If a tax is not set at the correct rate, the price signal sent by the instrument may not be sufficient to alter producer and consumer behaviour. Data requirements have often been cited as obstacles for the introduction of more traditional environmental taxation.

Limited knowledge and experience of circular taxation. Historically, the focus of environmental taxation has been on internalising externalities. Therefore, there is a lack of knowledge and experience relating to the design and implementation of environmental taxes that go beyond this objective, to promote a circular economy – the institutional and policy making process might not yet be sufficiently adapted. There are limited examples to learn from, which makes it difficult to anticipate the full set of impacts and to identify best practices.

Government Tax Collection Bodies

Difficulty of tax collection. The level of difficulty associated with collecting a tax can be a challenge to its implementation. Investment in monitoring and collection systems may be required, which could include the installation of new technology to enable the collection of fees from consumers. For example, in the case of road-user charging, if charging is to vary by time of day and location, this will require real time tracking of satellite data, which is a technical and political challenge.

Issues with compliance and enforcement. Problems with compliance and enforcement of environmental taxes are a challenge to their effectiveness. A lack of compliance can result from enforcement fines being too low relative to the tax or from insufficient monitoring. This has been suggested as a problem, for example, in the case of the UK landfill tax. Further, if the agency responsible for enforcing a tax is under-funded, their ability to robustly monitor and enforce compliance will be limited. If a tax is not adequately enforced, there may be perverse impacts created by the tax. For example, in the UK the landfill tax has contributed to an increase in waste crime.

Consumers

Public perception and political feasibility. Since taxes lower the consumption possibilities available to taxpaying citizens, public perception of taxation is usually negative. In particular, people often care about the perceived fairness of tax measures. The current cost of living crisis, which comes in quick succession to the economic consequences of

the covid pandemic, is hitting the most vulnerable in society hardest and is amplifying individuals' concerns about their financial circumstances. This may further increase resistance to tax increases. Tax reforms that are opposed by taxpaying voters will be politically difficult to implement.

Consumer incentives. The price and availability of alternative, sustainable products/ services impact how effective a circular tax can be. For example, in the case of Sweden's VAT reduction on repairs (see Section 3.1.3), the sectors eligible for the tax relief deal with products that are cheap and easy to find, in particular, textiles and shoes from fast fashion, which reduces consumer desire to opt for repairing these products.

Preference for ownership. Consumers may have a preference for ownership of a product and/or may be less familiar with alternative options, such as leasing, renting or sharing models. It may be a challenge for circular taxation to shift consumer behaviour towards more circular choices, as it battles against these behavioural biases.

Higher upfront cost of circular products. Circular products are longer lasting and tend to be made from higher quality, more durable and more repairable materials and components than linear products. This means that the upfront cost of circular products is usually higher than linear products, even though the actual cost per unit of lifetime is lower for circular products than for linear products. Consumers might often not take this into account in their purchasing decision, and instead base the decision on the initial upfront cost. It is a challenge for circular taxation to close the gap between the upfront cost of circular and linear products in order to incentivise consumers to choose more circular products or services.

Lack of knowledge of how to maintain, repair or ensure reuse of products, and lack of accessibility of these options. Circularity requires consumers to extend the useful lifetime of products for as long as possible. If consumers do not have sufficient awareness or knowledge of how to do this or are not able to access the services that allow them to do so, then circular practices will not be followed. In this case it might be a challenge for circular taxation to incentivise consumers to seek out more circular ways of using products, including maintenance and reuse options.

Lack of convenient circular end-of-life options. If convenient repair, reuse, recycling, take-back or other circular end-of-life services are not available to consumers, they may accumulate products that are no longer fit for their intended purpose and keep them stored rather than in use. It is a challenge for circular taxation to incentivise consumers to repair, refurbish or upgrade these products, so that they are more likely to be reused rather than stored or improperly disposed of.

Producers

Concerns about lack of enforcement and competitiveness. If producers do not have confidence in the monitoring and enforcement systems in place to ensure compliance with circular taxation, then they may be concerned about losing competitiveness relative to other businesses that fail to comply with the circular tax measures and so have lower costs. These concerns can make producers resistant to the introduction of new circular taxes.

Administrative burden. If producers are likely to face burdensome administrative requirements relating to monitoring and collection of circular taxes, then they may be resistant to the introduction of circular taxes.

Political feasibility. If businesses have concerns about new circular taxes and are resistant to their introduction, then it will be politically difficult for governments to implement circular taxes. For example, the original proposals for the plastic tax now due to enter into force in Italy in 2023 had to be diluted because of resistance from producers.⁹⁷

⁹⁷ The Local Italy (2019) *Italy waters down plastic tax after complaints from business*, accessed 22/8/22, <https://www.thelocal.it/20191205/italy-waters-down-plastic-tax-after-complaints-from-business/>

4.0 Recommendations for design and implementation

In this section, we outline our recommendations on the design and implementation of circular taxation mechanisms across the EU, based on the findings from Section 3.1 on the case studies, and Section 3.2 on the barriers faced by current circular taxes, literature review, interviews held with six sector experts and an internal workshop. The six experts include circular taxation practitioners from the European Commission, Member States and external advisors to the European Union on environmental taxation. This section looks at how circular taxes can be further developed to overcome the identified barriers and increase their scope and effectiveness to speed up the transition to a circular economy.

4.1 Overall Design and Implementation

4.1.1 Tax Rate

Make purchasing new linear products more expensive relative to circular alternatives. The fundamental principle behind imposing a circular tax is to make the purchasing of new products, those that use virgin (primary) materials and are in their first use, called linear products, more expensive. Imposing a tax on a linear product raises its price. This makes a second-hand product or one that uses recycled or secondary material, called a circular product, relatively cheaper and therefore relatively more attractive to purchase. For example, if the price of a fleece using virgin material costs €50, and the equivalent made from recycled material costs €75, then the fleece made from virgin material could be taxed €25 to increase its price to €75. This is shown on the left-hand chart in Figure 7 below, where the environmental and circular taxes increase the price of the linear product from €50 to €75, the price of the circular product. Though consumers will likely have legitimate concerns over inflation and its impact on affordability and cost of living, an increase in the price of linear products is one of the main requirements to drive consumption of these products down. Furthermore, Figure 7 below depicts how the price of circular products or alternatives could actually *fall* following the introduction of a tax on linear products.

Figure 7 Illustrative example of how to set tax levels to increase the price of linear products, and drive the price of circular products down



Use revenue collected from circular tax to invest in circular solutions and infrastructures. Part of the revenues collected from the tax on the linear product can then be used to invest in improving the production/distribution process and driving down costs of circular alternatives (see Section 0), with the aim of driving down its price over time. This would enable the circular product to be able to compete more closely with the linear product on both cost and price fronts, as shown by the right-hand chart in Figure 7. Eventually, the aim would be for the circular alternative to be priced below the linear product – consumers would then access the same utility from a circular product as they do from a linear product but at a lower cost for them and while using fewer resources, which is the aim of a circular tax.

Adjust the tax rate once market has had time to respond. In order to achieve the desired outcomes of a tax, ideally the optimal tax rate could be set from the start. However, given that the market is likely to respond differently to how was conceived of in the design phase of the tax, or that certain market conditions might not have been known, in reality setting the optimal rate from the start is very hard to achieve. Therefore, rather than trying to be too accurate in the estimation of the tax rate from its inception, and potentially delaying its introduction in doing so, the tax should be introduced with a strong signal of intent given in advance and the visibility on its progressive adjustment (see next paragraph), and then it can be adjusted accordingly once the market has had time to respond and outcomes have been observed. The UK Landfill Tax is a good example of this – when the desired outcomes weren't achieved when first introduced, the tax rate was increased to drive further decreases in landfilling and increases in recycling (see Section 3.1.4).

Increase tax rate over time. Tax rates should be set at a lower rate initially when first introduced, and then increased over time gradually, using a step-by-step increase which is also referred to as a 'tax escalator'. Tax escalators are announced well in advance, so the market knows what to expect in coming years. This will give the target audience, producers (businesses and manufacturers) and consumers, time to adapt their behaviour and move from a linear economy structure toward a more circular one, and will therefore be more politically feasible to implement. This can be observed e.g. in the UK landfill tax case with the tax rate increasing incrementally each year (see Section 3.1.4). If from the onset of a tax, the tax level is set too high, this will be more likely to meet resistance and would more likely lead to non-compliance.

Avoid loopholes and perverse behaviour. It is important to note that allowing for exemptions to a specific circular tax could lead to the creation of loopholes that can be taken advantage of. For example, the number of exemptions allowed in the UK Landfill Tax meant that waste was often misclassified at authorised landfill sites for the financial gain of the landfill site operator (see Section 3.1.4). Similar is the case of wide exemptions for national plastic taxes which are not solidly justified on environmental ground and which might dilute the price signal and complicate enforcement (see

Section 3.1.1). Equally, setting differential tax rates where this is not justified by the goals of the tax (or to ensure progressivity in taxation) can also encourage this kind of adverse behaviour. Where exemptions are built into the tax design, increased monitoring and enforcement is needed.

4.1.2 Stakeholder Support & Communication

When implementing circular taxes and any other fiscal measures, gaining support from the public and wider stakeholders (e.g. businesses) is key. Stakeholder support will help **ensure that tax reforms are more likely to be long lasting** despite political changes. In the expert interviews, the importance of gaining public support and social acceptance of the tax was also emphasised as key. This can be done by spreading general awareness regarding the benefits of the tax, which encourages the **adoption of more circular behaviours**.

Communicate the rationale and benefits of the circular tax. Taxes have historically been politically unpopular – public perception of taxes tends to be negative as it involves payment from a consumer or a business to the government, and therefore a loss of net revenue, income or spending power. Similarly, it can also be the case that many people are simply not aware of the environmental benefits of the circular tax; see Section 3.1.3 for the case study on the Swedish VAT relief where consumers were not aware about the relief for the repair service, and businesses highlighted this as part of the reason why an increase in repairs was not seen.

Any tax designed and implemented should be based on thorough and transparent participatory processes and build into its plan a well thought communication plan. Communications can be done through education campaigns, appropriate labelling, information at the point-of-sale, and awareness of alternatives and substitutes. It is important that targeted communication campaigns include:

- The reasons why the circular tax is being implemented,
- The reasons why the tax will be beneficial from an environmental perspective,
- The argument that its net social impact will be positive,
- Availability of alternatives to access the same utility: the ability of people to avoid, or minimise their exposure to the tax by changing their behaviour and choosing circular alternatives

Depending on the circular tax being designed, communications to the target audience should include, in simple and accessible terms, how circular taxes are being used to reduce resource use, incentivise reuse and high-quality recycling, penalise overconsumption and overproduction, reduce end-of-life waste, and what its subsequent beneficial effects are on the broader issues of natural resources, biodiversity and climate change. Social aspects should also be included, to reassure the citizens that circular taxes will not aggravate inequalities.

In addition, involving the citizens and other relevant stakeholders in tax design through direct consultation activities can increase acceptance of the taxes and prevent public backlash during implementation.

Ensure enough time is allowed between announcing the introduction of the tax and implementing it. To give consumers and producers time to adapt their behaviour, it is important to announce the introduction of the tax far in advance of the date it will come into force.⁹⁸ For a tax requiring little behaviour change, the typical period allowed is 1 to 2 years. For a tax that requires a larger change in behaviour and/or infrastructure development, the period should

⁹⁸ World Bank (2022). Innovations in Tax Compliance: Building Trust, Navigating Politics, and Tailoring Reform. <https://www.worldbank.org/en/events/2022/02/17/innovations-in-tax-compliance-building-trust-navigating-politics-and-tailoring-reform>

be longer. This would give the target audience enough time to change their behaviour so as to avoid, or minimise their exposure to, the tax.

Additionally, another design aspect that will affect the implementation is having a **tax escalator**, meaning the tax rate will gradually increase over time, as discussed in Section 4.1.1. A tax escalator enables a smooth rollout across the government, businesses and consumers and can help increase public acceptance.

Ensure availability of alternatives or substitutes and reinforce the emergence of alternative consumption models.

Complementary to the design of the tax rate, the availability of alternative products, services and/or consumption models can also help avoid perverse behaviour and encourage the shift to a circular economy. According to the stakeholder interviews, the ability to gain political and public support is easier if alternatives or substitutes are available. An alternative or substitute good or service has **different forms but offer similar functionality, purpose and utility**. Prior to the implementation of the tax, alternatives or substitutes should be made available or publicly known to give the public or businesses an opportunity to avoid the tax. An example of this can be the plastic carrier bag charge which was implemented under the Plastic Bags Directive in the EU. According to the 2022 study completed by Eunomia, the charge on the single use plastic carrier bags aims to reduce the consumption of single use plastic, combat littering, change consumer behaviour and promote waste prevention.⁹⁹ In response to the charge, consumers switched to reusable carrier bags, such as cotton or canvas bags, as an alternative which provides evidence that the charge was successful in shifting behaviour.¹⁰⁰

Another example would be the shift to reusable packaging options. Consumers are aware of the negative impacts of single use packaging and are switching to reusable options as an alternative, sustainable option. Under the EU Directive 2019/904 to reduce the impact of certain plastic products on the environment, Ireland is implementing a charge on single use cups at the end of 2022 in order to decrease consumption of single use plastics.¹⁰¹ As an alternative to single-use plastic cups, it is expected that consumers will most likely switch to reusable cups as a result of the charge.

Depending on the specific circular tax, the type of alternatives will differ (e.g. alternative or substitute product, new packaging materials, infrastructure or technology). However, providing an alternative or substitute can **incentivise behaviour change** and encourage a shift towards a circular economy. The availability of alternatives prior to implementing a circular tax could also help gain stakeholder support because it would be easier for producers and consumers to switch to alternatives.

4.1.3 Compliance, Monitoring and Enforcement

Compliance, monitoring and enforcement are crucial parts in the implementation of any tax. With circular taxes it is important to ensure the tax is going beyond applying the polluter pays principle and that the desired behaviour change is occurring. As seen in the case studies, compliance and enforcement is often a challenge that all kinds of taxes present which can restrict their effectiveness.

Ensure appropriate monitoring and enforcement, including provision of funding. Monitoring and enforcement of the tax needs to be built into the tax design right from the inception, otherwise this will increase risks of non-compliance. If the taxpayer has the perception that the probability of getting caught for not paying that tax is low, due to low levels of monitoring, then increased levels of monitoring should be implemented to counter this.

⁹⁹ European Commission, Directorate-General for Environment, Sherrington, C., Watson, S., Marsh, P., et al. (2022) *Scoping study to assess the feasibility of further EU measures on waste prevention and implementation of the Plastic Bags Directive . Part II, Implementation of Plastic Bags Directive*. Publications Office of the European Union. <https://data.europa.eu/doi/10.2779/304791>

¹⁰⁰ *ibid.*

¹⁰¹ Government of Ireland (2021). *Single-use Plastics*. <https://www.gov.ie/en/publication/ef24a-single-use-plastics/>

Budget needs to be allocated for **data collection and monitoring** and/or any new technological innovation that is needed. To this end, any new tax that is implemented will require data collection and spending on new systems and databases to enable this. One barrier identified from road-user charging is the difficulty associated with using new complex systems and technologies to track vehicles and calculate how much they each need to pay. This technology can be complex as well as being very costly to implement. Therefore, when designing the tax, it is important to budget for any needs like this too, and account for it in net tax calculations. The alternative is to implement a tax which does not require investment in complex and costly infrastructure or technological innovation.

An important additional element is the provision of **funding for the bodies** who are responsible for monitoring and enforcing the tax. One means to achieve this is to allocate a share of the tax revenue to cover, or contribute to, the costs of monitoring and enforcement of that same tax. The Environment Agency, who is responsible for enforcing the UK landfill tax, is under-funded which limits their ability to monitor and enforce compliance. Due to the lack of enforcement, there has been an increase in waste crime within the UK. Similarly, in the case study on the economic incentives on cars in Section 3.1.2, investment is needed in new monitoring and fee collection infrastructure in order to successfully enforce the fiscal mechanisms.

Stakeholders consulted noted that **training** is very critical in the implementation process of a tax for actors that are monitoring and enforcing the tax as well as those that are complying with the tax (businesses, waste management, public, etc.). Those that are working on collecting the tax need to be properly trained to ensure compliance as well as those that declare and pay the tax. For example, the UK landfill tax (see Section 3.1.4) has a large amount of waste misclassification which can be attributed to waste crime and to the lack of training those that classify the waste. In addition, the tax should have a simple design to reduce exemptions which can increase non-compliance. as seen in the UK landfill tax.

Provide supporting infrastructure to prevent perverse behaviour. It is important that in the design of the tax, appropriate supporting infrastructure is provided to users to ensure the smooth running of the tax scheme and to prevent perverse behaviour. For example, in the Pay As You Throw (PAYT) scheme introduced in the county of Aschaffenburg, Germany, locks for bins were offered as an optional service to avoid misuse of bins by unauthorized users.¹⁰² In Schweinfurt district in Bavaria, Germany, a gravity lock was offered to households as an optional extra at a cost of €0.50 per month, as a way of tackling the issue of neighbours using the bins of others to reduce the charges they needed to pay.¹⁰³

Ensure penalties are high enough to disincentivise non-compliance. In order to disincentivise non-compliance, enforcement fines, imposed when a payer fails to pay the tax or violates the law, need to be set much higher than the tax rate itself. If the fine is not high enough, the taxpayer may be incentivised to break the law knowing that in the low probability they will get caught, they will not have much to pay. The penalties should outweigh the cost of compliance to effectively disincentivise evading the tax.

For example, for illustrative purposes, if a tax is set at a fixed rate of €50 for the year, the enforcement fine for not paying set to €200 for the year, and the chances of getting caught for not paying it is 20%, then the consumer may be incentivised to not pay the tax as they would likely have to pay $20\% * €200$ (enforcement fine) = €40, which is lower than the tax rate of €50. This is seen in the example of the UK landfill tax in Section 3.1.4, where the lack of compliance resulted from the fines being too low in relation to the tax rate.

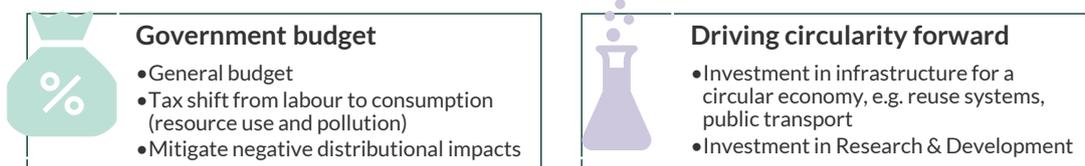
¹⁰² Morlock et al (2017) 'The Impact of Pay-As-You-Throw Schemes on Municipal Solid Waste Management: The Exemplar Case of the County of Aschaffenburg, Germany', MDPI. Available at: <https://www.mdpi.com/2079-9276/6/1/8/pdf>

¹⁰³ Eunomia (2011) *A Comparative Study on Economic Instruments Promoting Waste Prevention – Final Report to Bruxelles Environnement*

4.1.4 Use of Revenues and Systemic Tax Shift

Revenues collected from circular taxation can be used in various ways, and lessons can be drawn from best practice examples. The use of revenue can be split into two broad categories: government budget, and driving circularity forward, as shown by Figure 8.

Figure 8 Different use of revenues collected via circular taxes



Government budget: The revenue could be used as part of the government's general budget to fund general state activities, such as essential public services. It could also be used to subsidise, for example, the mitigation of perverse distributional impacts that the circular tax may lead to.

Driving circularity forward: The revenue could be used to drive circularity forward by using the revenue to fund Research & Development (R&D) or new infrastructures needed to support circular practices. When implementing circular taxation, the revenue from the tax (or part of it) could be used to **further invest** in shifting from a linear to a circular economy. This would involve investment in activities such as:

- Collection schemes
- Environmental regeneration
- Access to repair
- Sharing business models
- Waste management infrastructure
- Shifting from fossil-based products to sustainable use of renewable resources
- Information management systems
- Reuse infrastructure
- Green sector job creation (such as in repair, remanufacturing, recycling, etc.)

Revenue-neutrality: Circular taxes can be designed to be revenue-neutral whereby the changes in the tax law results in no change to the overall amount of revenue collected by the government. For example, **transferring the tax burden from labour to pollution and resource use** would result in a budget (revenue) neutral tax shift. This type of tax shift has been mentioned by the European Commission in the European Green Deal: '[A]t national level, the European Green Deal will create the context for broad-based tax reforms, removing subsidies for fossil fuels, shifting the tax burden from labour to pollution, and taking into account social considerations'.¹⁰⁴ It has been highlighted¹⁰⁵ that in the European Union only 6% of the tax revenue comes from environmental or circular taxes whilst 52% of the tax revenue is from labour through income tax, payroll tax and social security contributions. Also, a recent study by the Ex'tax Project assessed the impact of a budget-neutral package of 20 tax measures that shift the tax burden from labour to pollution and resource use in the European Union context. Compared with a business-as-usual scenario, these measures result in higher economic growth, **job creation and increased public investment, alongside reduced pollution and resource use**. The report found that gross domestic product (GDP) levels in the European Union in 2025 would be on average 1.6% higher whilst employment levels would be 3% higher, translating to six million more people being in employment and CO₂ emissions falling by 7.1% compared to 2021 levels.¹⁰⁶ The study highlights that in shifting the tax burden (from labour taxes to product taxes), effective planning for the use of revenue is crucial in

¹⁰⁴ European Commission, (2019). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 'The European Green Deal' (COM(2019) 640 final of 11 December 2019).

¹⁰⁵ IEEP et al. 2021. Green taxation and other economic Instruments: Internalising environmental costs to make the polluter pay ([link to report](#))

¹⁰⁶ The Ex'tax Project (2022). *The Taxshift: An EU Fiscal Strategy to Support the Inclusive Circular Economy* <https://ex-tax.com/taxshift/>

promoting a just and inclusive transition to a circular economy. This tax shift does not result in reduced government services such as social security, health and employment services since tax revenue is still being collected.

Earmarking revenues: Earmarking revenues from circular taxes can also help a country meet their environmental targets as well as align with the UN sustainable development goals on consumption and production.¹⁰⁷ The European Union's new Circular Economy Action Plan to promote sustainability and resource productivity is set to follow the Industrial Strategy which discusses cluster policy meaning that businesses in proximity can cooperate together to produce a product, good or service locally.¹⁰⁸ The Industrial Strategy also emphasises skills and knowledge within the workforce to support the transition to a circular economy with the re-shoring of production and use of new green technology.¹⁰⁹ Therefore, the earmarking of revenues could be used, for example, to fund skills development to further develop the workforce and contribute to a country's labour/industrial strategy.

When conducting an internal workshop with experts, in addition to using the revenue to improve waste management infrastructure and collection systems, there was discussion on using the revenue to design better products, promote circular consumption models, shift from limited resources to regenerative resources, and increase the durability of products. The expert interviews suggested that the earmarking of tax revenue is considered on a case-by-case basis and that it can be used to convince the public and other stakeholders that the revenue is being used to improve the environment or circularity of a system. However, some experts stated that the earmarking of tax revenue is not an efficient use of government finances, and it can make the development of policies more complicated. In addition, other experts are in favour of a revenue-neutral tax shift but the affordability and impacts of a similar tax shift need to be carefully considered.

4.1.5 Summary of recommendations

In summary, the design of circular taxes need to go beyond internalising the external cost to make the purchase of linear products more expensive relative to their circular alternatives. Some of the revenues from these circular taxes can then be used to invest in circular solutions and infrastructure, as well as to mitigate some of the adverse distributional impacts of these taxes. Table 5 provides a summary of the overall circular tax design recommendations by different design elements.

Table 5 Summary of overall circular tax design recommendations, by component

Component	Recommendation
Tax rate	Make purchasing new linear products more expensive relative to circular alternatives
	Use (part of) revenue collected from circular tax to invest in circular solutions and infrastructures
	Adjust the tax rate once market has had time respond
	Increase tax rate over time
	Avoid loopholes & adverse behaviour (exemptions)
Stakeholder Support and Communication	Communicate the rationale and benefits of the circular tax
	Announce the introduction of the tax in advance of the implementation date
	Ensure availability of alternatives or substitutes and reinforce the emergence of alternative consumption models
	Ensure appropriate monitoring and enforcement, including provision of funding

¹⁰⁷ United Nations Sustainable Development Goals, (2022). *Goal 12: Ensure sustainable consumption and production patterns.* <https://www.un.org/sustainabledevelopment/sustainable-consumption-production/>

¹⁰⁸ European Commission (2022). European Industrial Strategy. https://single-market-economy.ec.europa.eu/industry/strategy_en

¹⁰⁹ *ibid.*

Component	Recommendation
Compliance, Monitoring and Enforcement	Provide supporting infrastructure to prevent perverse behaviour
	Ensure penalties are high enough to disincentivise non-compliance
Use of Revenues and Systemic Tax Shift	Use in government general budget
	Transfer the tax burden from labour to pollution and resources
	Invest in advancement of circularity, via R&D and/or infrastructure
	Mitigate negative distributional impacts

4.2 Recommendations by Lifecycle Stage

This section outlines the design and implementation recommendations for the circular taxes that target each of the lifecycle stages – materials and production, purchase, use, and end-of-life. They are intended to provide some leading guiding principles for these circular taxes.

Materials and Production

The circular economy starts at the material extraction and production, and a large part of a product's environmental impact and circular potential is determined at these stages. It is therefore important to redesign production processes to be circular – processes that design out waste, hazardous elements and recycling disruptors that would reduce the product's ability to re-enter the circulation loop at the end-of-life.

Circular taxes should be designed so that at the production stage of a product, taxes are imposed on the proportion of virgin content in the product, and taxes are reduced (or subsidies given) for the proportion of recycled content in the product. Doing so will incentivise a **shift from virgin material to recycled material use**. By doing so, when materials reach their end-of-life they are recycled back into new products, strengthening circulation loops and reducing the amount of material ending up in landfill or incineration.

Taxing the amount of material and other resources used in a product, and to make a product: Imposing a tax on the amount of material used in a product will encourage an overall reduction in resource use. Equally, a tax can be imposed on the amount of resources (water, energy, land, rare earth metals) that were used to produce the product. Care should be taken, however, for light-weighting not to come at the expense of the durability and life span of the product or circularity of the lightweighting materials (e.g. carbon fibres).

Purchase

Encourage the sharing economy instead of purchasing models, where appropriate: The sharing economy is an economic model based on sharing access to goods and services rather than using them just privately or individually. Encouraging a sharing economy and increasing the number of goods that are shared rather than purchased for private or individual use will reduce consumption overall and lead to more waste prevention. Here we include encouraging access over ownership as part of the sharing economy. A car is a classic example of a good that can be shared, as outlined in section 3.1.2. Housing is also a good that is highly suitable for sharing, given that many second homes (or even first homes sometimes) are often only used for part of the year – the lodging sharing service AirBnB started up for homeowners to make use of spare bedrooms. Home and garden tools, such as lawn mowers and drills, and high value clothing, such as wedding suits and tuxedos, which are often not used regularly (perhaps just once or twice a year) are also example products that could fit the sharing or renting economy instead of the private use economy. However, care must be taken to regulate the sharing economy too, where appropriate, to prevent any negative social

consequences. For example, AirBnB has in some cities had the effect of displacing locals in favour of tourists and driving up prices, so in these cases appropriate rules need to be put in place. Privacy and safety concerns also need to be addressed in the sharing economy, as well as guaranteeing employment conditions, good quality service and preventing an excessive concentration of market power by sharing economy platforms.

Make purchasing models more expensive: The tax rate should be set so that purchasing models are made relatively more expensive compared to sharing models (which should be regulated). For example, to encourage sharing of cars, parking space on public streets should be taxed and free parking should be removed for private car owners, and instead, free parking should be allowed only for cars which are shared. This would reduce the convenience and increase the price of car ownership, shifting culture towards car sharing. A similar principle can be applied to homes, home and garden tools, and high value clothing.

Achieve a large difference in price: The tax imposed on new goods put on the market should be high enough to drive up its price, so that a significant difference in price is created between the new good and the more circular alternative/substitute (e.g. reused/refurbished products, rental services, etc). A tax on new vehicle tyres would make new vehicle tyres relatively more expensive, and thus provide an incentive for consumers to opt for the retreading of used tyres to lengthen their life span, thus having a benefit in terms of the circularity of the market for tyres by reducing the demand for new tyres. This tax could be supported by policies such as green public procurement, which is so far a voluntary tool for public authorities that favours products, services and works that respect the environment.

Tax single-use items: Taxes should be introduced on single-use items and products for which alternatives exist, such as bottles, cups, straws and plates, as well as disposable batteries. This will discourage their use in favour of reusable and refillable and rechargeable alternatives.

Leverage product passports: Products can be taxed on their raw material type and content, their supply chain and other elements. Digital product passports can be used to track and identify these elements such as material type content, source of material, supply chain history, border-crossing, and more. Product passports therefore allow for increased transparency, address some of the data challenges of circular taxes, and help with monitoring and enforcement challenges. Additionally, product passports can reduce administrative burden by forming the basis on which product characteristics are taxed (avoiding duplication of data and relying on data already required by law. e.g. with EU Digital Product Passport).

Ensure circular taxes are applied to imports as well as domestically produced goods: Any circular tax that is applied to domestically produced goods must also be applied to imported goods. Failing to do so would likely make the domestic good uncompetitive compared to the imported good, as it would not be able to compete on price. This concept is now being applied to carbon taxes through the Carbon Border Adjustment Mechanism (CBAM) – this mechanism increases the cost of importing products into the EU from countries that do not levy a carbon tax. This is therefore meant to prevent carbon leakage by ensuring imported goods also pay a carbon tax when entering a country.

Use

VAT relief for repair and reuse: We recommend VAT relief is given to the repair, refurbishment and remanufacturing of goods and products. This would bring down their overall price and encourage the reuse of products rather than the purchasing of new products. In periods of high inflation, VAT relief becomes even more important.

It is important to note that VAT relief will likely be more effective with **certain products** than others. For example, it would seem likely that VAT relief granted to the repair of clothes and textiles to encourage their purchase over new clothes may prove ineffective as a policy if the second-hand market is competing against the very low-cost fast fashion market, which is able to sell at very low prices. To mitigate this, it is recommended that **VAT relief is implemented in conjunction with other forms of regulation** (e.g. eco-design requirements) **and of taxation** which makes resource

intensive and disposable products more expensive. Therefore, repair and reuse will be incentivised by making it financially beneficial to repair and reuse rather than buy new.

Lack of information about the tax relief for the repair in Sweden was provided as a reason companies thought they were not seeing an increase in repair (see Section 3.1.3). Therefore, it is important that **communication campaigns** are included in the design, providing information about how the VAT reduction works, which products are eligible, and how and where to access it.

Amend EU legislation to allow for changes to VAT rates: Any circular taxes proposed need to comply with wider legislation in a country. For example, in France, members of parliament make numerous proposals regarding reduced VAT rates each year during the preparation of the finance bills. However, due to the limited list of goods and services eligible for a reduced rate provided by the EU VAT Directive, most of those proposals are rejected.¹¹⁰ In cases like this, the VAT Directive should be amended to provide Member States with the possibility of introducing reduced rates on goods or services on the condition that this subsidy applies as part of a green policy.

End-of-Life

Tax related to the reusability, repairability and/or recyclability of a product: Taxes should be charged to incentivise waste prevention, and therefore be charged on the extent to which a product can be prevented from becoming waste. **Non-reusable, non-repairable and non-recyclable products** should incur higher taxes (or outright bans as proportionate and when alternatives exist, e.g. non-recyclable packaging), as these products will likely end up being landfilled or incinerated, instead of reused, repaired or recycled, upon reaching end-of-life, preventing recirculation.

Incineration tax: Alongside a landfill tax, already discussed, a tax should be introduced for incineration – an environmental tax paid on top of normal incineration rates by any company, local authority or other organization that wishes to dispose of waste at an approved incineration facility. Albeit, as of 2026, municipal incinerators should be in the scope of the EU Emissions Trading Scheme (ETS),¹¹¹ a major carbon market, so an incineration tax would not be needed at that point.

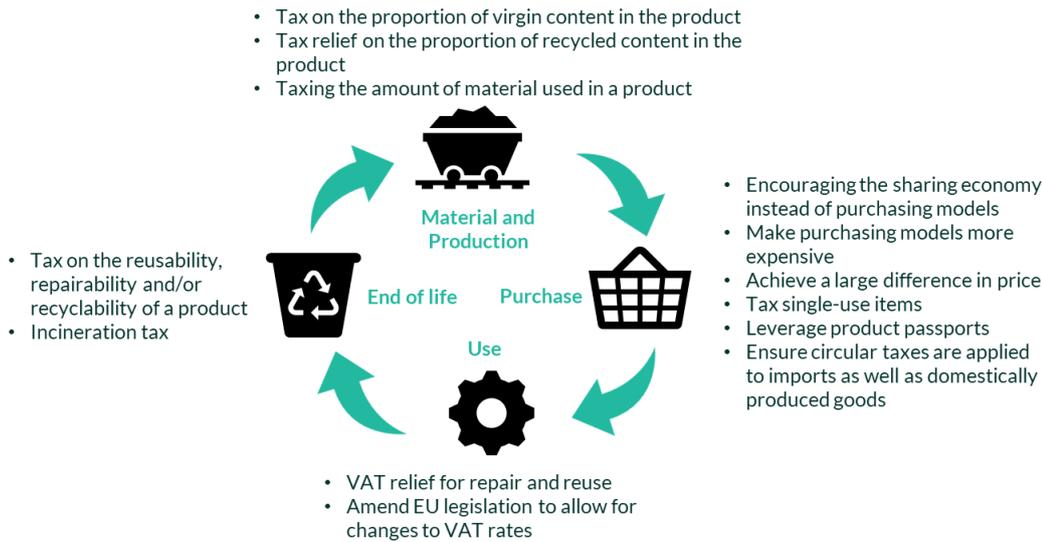
Summary of recommendations

In summary, at the material and production stage, circular taxes should be designed to reduce the amount of primary materials and other resources used in production and incentivise a shift to recycled materials. At the purchase stage, these taxes should aim to create a substantial difference in price between the purchase model and the sharing model, while at the use stage they should aim to provide tax reliefs to encourage more repair and reuse. Finally, at the end-of-life stage, circular taxes should incentivise reusability, repairability and/or recyclability of a product, while discouraging landfilling and incineration. Figure 9 illustrates the different design and implementation recommendations for circular taxes by their lifecycle stages.

¹¹⁰ Bloomberg (2020) *INSIGHT: Using VAT as a Tool to Fight Climate Change?* Available at: <https://news.bloombergtax.com/daily-tax-report-international/insight-using-vat-as-a-tool-to-fight-climate-change>

¹¹¹ Zero Waste Europe (2022) *The EP approves the inclusion of municipal incinerators in ETS as of 2026.* Available at: <https://zerowasteurope.eu/press-release/the-ep-approves-the-inclusion-of-municipal-incinerators-in-ets-as-of-2026-2/#:~:text=Today%20the%20members%20of%20the,emissions%20from%20municipal%20waste%20incinerators.>

Figure 9 Circular tax design and implementation recommendations, by lifecycle stage



5.0 Tax policy coordination

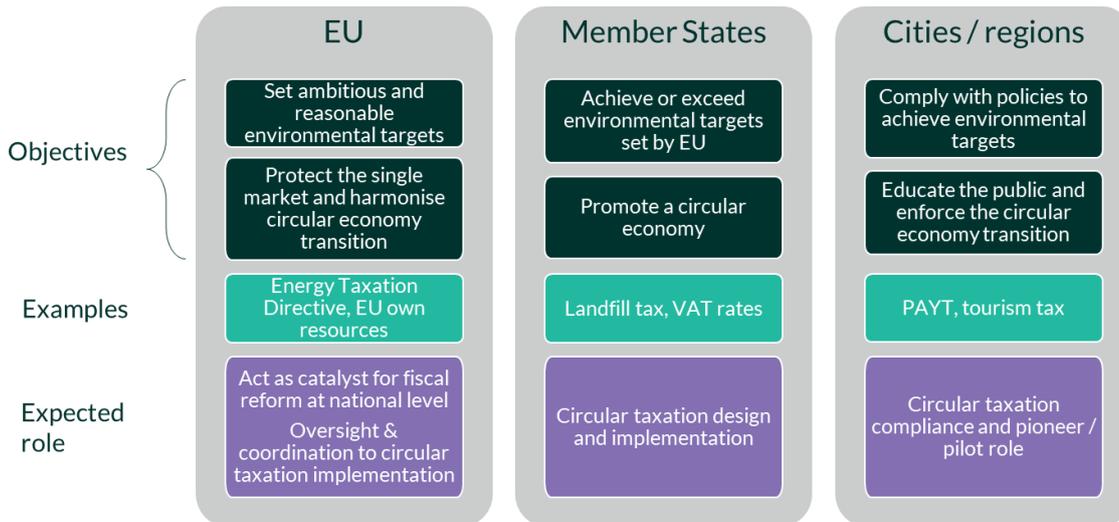
Tax policy coordination across the European Union is a vital aspect of circular taxation implementation as it should maximise the signal for change to producers or providers who might sell or provide services across multiple markets. Also, significant changes in the tax regimes between Member States might have impacts for the Single Market. According to the Ex'tax report, it is suggested that it is Member States' responsibility to start deploying circular taxation schemes, these first unilateral steps would then create the conditions for further tax reform to be implemented in coalitions with like-minded neighbouring countries (e.g. via the enhanced cooperation procedure) as well as jointly across the EU27.¹¹² It is also advised that EU and national institutions need to work together on an inclusive approach to environment taxation reform with the business community and should adopt a long-term vision with the interests of society at the centre.¹¹³

There are **three distinct political levels** in the EU: the EU institutions, Member State and city/regional level. Each level has their own objectives and roles within tax implementation. The EU main role in tax implementation is to provide oversight and coordination while protecting the Single Market, and to set any environmental targets for Member States to achieve. The EU can therefore create the conditions and the framework for tax shift to occur, which may prompt national fiscal actions. The EU, however, does not have direct competencies on taxation. The Member State's role is to achieve environmental objectives and encourage a circular economy through circular taxation implementation. Although the role of raising taxes at a local level will vary greatly by Member State, the city/regional role is to comply with the circular tax, such as reporting revenues to the national government, while providing education to the public about the benefits and importance of the tax. The figure below provides the objective, an example and the expected role for the different political levels.

¹¹² The Ex'Tax Project (2022) The Taxshift: An EU Fiscal Strategy to Support the Inclusive Circular Economy, 2022, <https://ex-tax.com/wp-content/uploads/2022/06/The-Taxshift-EU-Fiscal-Strategy-Extax-Project-2June22def.pdf>

¹¹³ *ibid.*

Figure 10 Objectives, examples and expected role for the different political levels



The following sections describe in more detail each political level's role in the implementation of circular taxes.

5.1 EU level

The legal capacity of tax implementation, setting tax rates and collecting tax revenues is at the Member State level and the European Union has limited competences over tax policy.¹¹⁴ Historically taxation related legislation has been closely linked to national sovereignty due to its role in national budget and revenue. Consequently, any adoption of taxation related proposal at the EU level has been decided by a special legislative procedure which requires unanimity among all Member States. This requirement for unanimity often acts as a major stumbling block for implementing any common taxation related policy at the EU level. However, with the new challenges emerging in the EU and globally, a purely national approach to taxation no longer works in a more integrated EU, and unanimity is neither a practical nor an effective way of decision-making.¹¹⁵ In fact, qualified majority voting is now the standard rule for policies that are just as politically sensitive as taxation (e.g. harmonisation of Single Market rules, judicial cooperation in civil matters, etc.), and taxation is the only remaining EU policy area that still requires unanimity for decision-making. Moving to the **ordinary legislative procedure** only requiring **qualified majority voting for decision making on tax legislation at the EU level** will allow for a coordinated approach to implementing a common framework for circular taxation across the EU.

In addition, the European Union does have power to **set targets to incentivise Member States** to implement certain policy changes. Therefore, it is suggested that the European Union set specific targets related to circular economy goals to encourage tax implementation by Member States (e.g. resource consumption reduction targets). In the Energy Taxation Directive¹¹⁶ the European Union set a framework of conditions for the taxation of electricity, motor and aviation fuels, and heating fuels, and each Member State has the ability to implement specific policies to comply with the Directive. Drawing from the example of this Directive, the EU could set minimum tax rates for resource use (e.g. water, rare earth metals, etc), as has been done for fuels. Another example of how EU policy can act as a catalyst for fiscal reform at the national level has been the adoption of the EU Single-Use Plastics Directive which, for example, led to Ireland aiming to be the first country to eliminate the use of single-use cups by implementing a charge on the

¹¹⁴ European Parliament (2022). *General tax policy*. <https://www.europarl.europa.eu/factsheets/en/sheet/92/general-tax-policy>

¹¹⁵ European Commission (2019). *Communication from the Commission to the European Parliament, the European Council and the Council: Towards a more efficient and democratic decision making in EU tax policy*. COM/2019/8 final. <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2019:8:FIN>

¹¹⁶ European Commission (2021). *Revision of the Energy Taxation Directive (ETD): Questions and Answers*. https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3662

cups at the end of 2022. In addition, the European Union could potentially develop guidance on how revenue should be used by Member State as a coherent approach would be helpful in promoting stability across the single market. As suggested in the Ex'tax report, the European Commission and Parliament should issue recommendations on the use of revenues to support the internal market and effective social policies.¹¹⁷

It is also a policy priority for the European Union to **fight against tax evasion and tax avoidance**.¹¹⁸ This can be done by suggesting minimum rates, like in the Energy Tax Directive, to limit large discrepancies between Member States. It was suggested in the expert interviews that the EU should define the minimum rate and tax base for certain environmental taxes but give the freedom to the Member State to apply the tax to their specific context. If there are various tax rates on a specific product, that can create distortions to the Single Market; therefore, it is key to have the taxes harmonised as much as possible. In addition, to further encourage compliance, the European Union could provide **oversight on the availability of alternatives and substitutes** within the Member States to ensure harmonisation and standardisation between countries. Similar technology or infrastructure should be made available across the Member States and the European Union could help ensure this by setting up a fund for countries to apply for funding in order to receive additional support to implement the technology or infrastructure. This can help ensure that citizens have access to similar products, infrastructure and technologies across each Member State. It is important to note that there may be regional and local disparities between and within Member States; therefore, it is important to **be aware of those disparities** to help achieve the desired outcomes from circular taxation implementation. Additionally, as raised within the expert interviews, the EU needs to consider competition between countries within the EU and global competitiveness in comparison to other countries that do not implement the taxes. Finally, the EU should play a more direct role in circular taxation by **revising and improving the Plastics Own Resource** outlined in section 3.1.1, to make it a stronger instrument for circularity.

5.2 Member State Level

When implementing circular taxation, the Member State level has two main objectives which include achieving or exceeding the environmental targets set by the European Union, and contributing to a country's industrial and labour strategy to promote and encourage a circular economy. It is encouraged that the Member States set more ambitious targets than the European Union's target in order to further promote the circular economy and be a frontrunner in the adoption of circular taxes. **The Member State has the competency to design, implement, and oversee the circular tax as well as utilise the revenue generated.**

The Member State should also implement an **evaluation system** to monitor if the circular tax is leading to the desired results and shift in behaviour. Additionally, it is advised that circular taxes in Member States are designed to mitigate loopholes as discussed in Section 4.1. There should also be a system in place to enforce the tax at a national level to prevent tax evasion or waste crime from occurring.

Furthermore, the Member State should provide local authorities and municipalities with the **required information about the tax** well in advance of its implementation, so that the required infrastructure is in place for collection, monitoring and enforcement of the tax. Additionally, part of the revenue raised through the tax could be used to further invest in reuse and waste management infrastructure, collection schemes and environmental regeneration. The use of the revenue should also be communicated to the public. Member States could also involve citizens and stakeholders in the tax design and implementation process itself through consultation activities. **Public involvement**

¹¹⁷ The Ex'Tax Project (2022) The Taxshift: An EU Fiscal Strategy to Support the Inclusive Circular Economy, 2022, <https://ex-tax.com/wp-content/uploads/2022/06/The-Taxshift-EU-Fiscal-Strategy-Extax-Project-2June22def.pdf>

¹¹⁸ European Parliament (2022). *General tax policy*. <https://www.europarl.europa.eu/factsheets/en/sheet/92/general-tax-policy>

and participation should help improve public acceptance of the tax, as it empowers citizens and involves them democratically.

As discussed in the expert interviews, a key challenge that might arise at the Member State level when implementing the taxes is the lobbying of different stakeholders and businesses to prevent the tax from being implemented. This challenge can be overcome by communicating and discussing with those that oppose the tax to help them realise the rationale behind the tax, and by starting with a low rate which can increase over time.

5.3 Cities and Regions

Although there are some variations in regional and local competencies across the EU, generally, the city and regional level are involved in **complying with the circular tax set at the Member State level** as well as **educating the public and enforcing the circular economy transition**. This can be seen by local municipalities reporting the tax revenue to the national government such as in the scenario of a landfill tax. In some Member States, municipalities can set their own taxes such as in Belgium, Germany and Poland.¹¹⁹ Whilst the controlled implementation of taxes in cities and regions is desired by the Member State or regional groups, there is a role for cities and regions to **pioneer circular taxation implementation** compared to Member States. This can be in terms of experimenting with different tax design and implementing methods, gathering results and helping pave the way for the Member State to roll out the tax nationally. This can be seen in Cyprus where a local municipality designed and implemented a Pay-As-You-Throw (PAYT) scheme and ran public education and awareness campaigns about the scheme that was being implemented. This helped gain public support and resulted in a 99.5% compliance rate among citizens.¹²⁰ Based on the local municipality results, Cyprus has introduced the PAYT scheme into regulation which will come into force at the end of June 2024.¹²¹ Additionally, cities and municipalities should look to the principle of green public procurement, a voluntary tool for public authorities that favours products, services and works that respect the environment, to drive positive environmental impacts.

It is also recommended, depending on the specific tax, that **the rates and enforcement procedures are the same or similar between cities and regions**. This is to prevent against tax evasion as well as limiting competition between cities. This has been seen in a report by the European Commission on the impacts of tourism taxes on the competitiveness within Europe, with tourism tax being implemented at differential rates in cities in different Member States which creates competition between countries.¹²² To mitigate against this, it is recommended that the taxes are implemented at a national level and have a similar tax rate to those surrounding Member States to avoid regional competition.

Additionally, the city and regional levels are the **first defence against tax evasion and waste crime**; therefore, proper monitoring and enforcement procedures need to be implemented prior to introducing the tax. Similar to the tourism tax example, having various taxes and tax rates between cities or regions will encourage citizens to evade the tax. For example, in Spain some autonomous communities (like Catalonia) had a landfill tax while others did not which resulted in competition for waste and diversion of waste from one community to another.¹²³ Therefore, coordination and local, national and regional harmonisation is key to encourage positive behaviour change and promote a circular economy.

¹¹⁹ CCRE (2007). Local and Regional Government in Europe: Structures and Competences. https://www.ccre.org/docs/Local_and_Regional_Government_in_Europe.EN.pdf

¹²⁰ Chrysostomou, A. (2021). "Cyprus prepares for pay-as-you-throw scheme". *Cyprus Mail*, Cyprus Mail. <https://cyprus-mail.com/2021/04/11/cyprus-prepares-for-pay-as-you-throw-scheme/>

¹²¹ Hazou, E. (2022). "House Passes 'Pay As You Throw' Law". *Cyprus Mail*, Cyprus Mail. <https://cyprus-mail.com/2022/07/07/house-passes-pay-as-you-throw-law/>

¹²² European Commission (2017). *The Impact of Taxes on the Competitiveness of European Tourism*. <https://www.europarl.europa.eu/cmsdata/130660/The%20Impact%20of%20Taxes%20on%20the%20Competitiveness%20of%20European%20Tourism.pdf>

¹²³ Puig-Ventosa, I., Martínez, A.C. and Sora, M.. (2012). Landfill and waste incineration taxes in Catalonia, Spain. 244-257. 10.4337/9781781009024.00031.

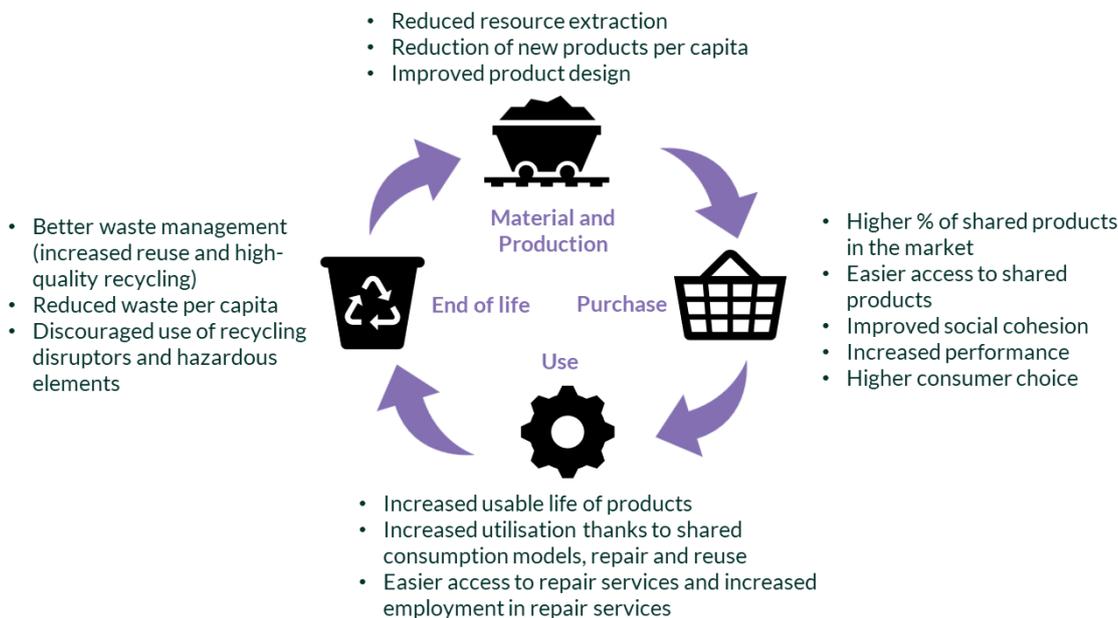
6.0 Expected Impacts of Circular Taxation

Circular taxes must play an increasingly prominent role in driving the circular economy forward and be deployed across sectors and product categories. Any new tax instruments proposed should follow the design principles and implementation recommendations set out in Section 4.0. This section outlines the expected impacts of circular taxation mechanisms including reduction in waste, improvement in resource efficiency, improved recirculation loops, transformation of wasteful linear economies into circular economies, and shift in consumer and producer behaviour.

6.1 Increased circularity

Circular taxation that is successful in improving materials and product circularity is expected to have impacts throughout the different stages of the product lifecycle.

Figure 11 Expected impacts of circular taxation on product lifecycle



Raw Material Extraction and Production

Reduced resource extraction. When circular taxes reduce the demand for new products, the demand for the extraction of new raw materials also falls. If circular taxation increases repair services, it should lead to a reduction in the purchase of new products. Furthermore, circular taxation can also encourage smaller and lighter products thus reducing material intensity and use.

Similarly, while the key focus of circular taxation should be to encourage less consumption of materials of all types, there will be some cases where using taxation to drive material substitution has clear merit. One example of this is the use of cross-laminated timber (CLT) for construction, as it delivers comparable technical performance to steel and concrete with a much lower carbon footprint.¹²⁴ While similar material substitutions could be encouraged through taxation, the merit of these material switches would have to be carefully assessed on a case-by-case basis.

¹²⁴ Osama A.B. Hassan, Fredrik Öberg, Emil Gezelius, *Cross-laminated timber flooring and concrete slab flooring: A comparative study of structural design, economic and environmental consequences*, Journal of Building Engineering, Volume 26, 2019,100881, ISSN 2352-7102, <https://doi.org/10.1016/j.jobbe.2019.100881>

On the producer side, if circular taxation incentivises for example the use of reusable packaging, consumer demand for the manufacture of new packaging should fall, and so the demand for the extraction of raw materials to produce new packaging should fall too.

Reduction in production of new products per capita. When circular taxes are applied, producers and consumers face a higher price for producing or using products. The higher price incentivises producers and consumers to shift towards reusable or longer-lived alternatives that are not affected by circular taxation. These alternatives can be reused or recycled products, or alternative business models, such as shared ownership of products. All of these options reduce consumer demand for new products (without decreasing utility) and so production of new products, per capita, decreases.

For example, the introduction of the EU Plastics Own Resource has encouraged some Member States to consider the introduction of national plastic taxes (see Section 3.1.1). Under these taxes, producers, importers, and/or sellers of single-use plastics face, at least in part, the cost of the externality generated by the plastic they are producing or using. This should incentivise a shift towards the production and use of recycled plastics or alternative products, depending on the design of the tax (including, for example, exemptions), thus reducing the amount of new plastic produced.

Better product design, including eco-design, leading to reduced resource extraction. Eco-design principles include: i) designing long-lasting products so that the useful life of the product is maximised; ii) designing products that are suitable for disassembly and reuse/ recycling, or for multiple reuses. Designing products in this way reduces demand for the extraction of new materials to produce new products.

Product Purchase / Consumption

Higher percentage of shared products in the market. Since circular taxation raises the upfront cost of product ownership, consumers are incentivised to seek alternative ways of accessing the services a product provides. One alternative is a shared-ownership model, which spreads the costs associated with the material content of the product over multiple users. Cars, for example, tend to have low utilisation rates. Utilisation rate can, however, be increased by new business models, such as those that provide shared mobility, like car-sharing and ride-pooling. This drives circularity by reducing the number of cars that need to be manufactured to provide the same mobility services, e.g. an equal number of trips.

Circular taxation incentivises **higher utilisation rates** and lead to greater uptake of shared-ownership business models.

Easier access to shared models. As demand for shared-ownership of products increases, these business models are likely to become available for more products and in more locations. This would allow easier access to shared products for a larger share of the population. Circular taxes can play a role in incentivising the shift to sharing by taxing private models but exempting shared models.

Improved social cohesion. Greater uptake of shared-ownership or shared use of products and of repair/refurbish activities has the potential to improve social cohesion in communities.¹²⁵ Consumers who are sharing a product may need to interact to facilitate exchange of a shared item. There may also be opportunities to share other information relating to the shared item, such as user experiences with a product or skills for use of the product.

Increased performance. Greater uptake of shared-ownership of products and of repairs may also drive demand for increased performance of these products. For example, a tool hire service may purchase higher quality and more durable tools since the utilisation rate of these products will be increased.

¹²⁵ Frenken, K. & Schor, J. (2017) *Putting the sharing economy into perspective*. Environmental Innovation and Societal Transitions, 23, 3-10,

Higher consumer choice. Greater uptake of shared-ownership of products may also increase the range of products available to consumers. Since consumers do not need to pay the full upfront cost of the product under a shared-ownership model, consumers, especially those with lower incomes, will be able to afford to access a larger set of products.

Product Use

Easier access to repair services. Circulation taxation can encourage the repair and reuse of products which extends their useful life. As demand for repair of products increases, provision of repair services is likely to become available for more products and in more locations. This would allow easier access to repair services for products, for a larger share of the population. Extended Producer responsibility (EPR) schemes could be required to contribute to repair services to ensure adequate accessibility of repair services.

Increased employment in repair services and services to facilitate product reuse. Increased provision of product repair and reuse services would generate employment. A report from the European Commission estimates that shifting to a circular economy could generate up to 60,000 additional jobs in 2030 in repair services alone.¹²⁶ Further, depending on the product requiring repair or redistribution for reuse, repair and reuse services may need to be provided locally to consumers and so job creation would be geographically distributed.

Product End-of-Life

Better waste management. Circular taxation instruments can directly target waste disposal and shift the paradigm from linear to circular solutions (e.g. landfill to recycling as seen in Section 3.1.4).

An increased rate of recycling also leads to an increase in the **amount of recycled content available**. When this recycled content is used in the production of new products, it replaces raw material content and therefore the amount of new raw material extracted falls. Where possible, reusing and repurposing products, however, should always be prioritised, as per the waste hierarchy, particularly where substituting virgin content with recycled content is challenging.

Reduced waste per capita. Because circular taxation leads to higher re-utilisation rates of products as well as reduced production and consumption of new products, the number of products reaching the end-of-life stage of the product lifecycle is reduced. Therefore, the amount of waste produced, per capita, is reduced.

Discouraged use of recycling disruptors and hazardous elements. Circular taxation can be designed to discourage the use of recycling disruptors or hazardous elements in order to increase recyclability of certain products.¹²⁷

6.2 Producer and Consumer Behaviour

The shift to a circular economy will require changes in the behaviour of producers and consumers, and circular taxation has a key role to play by providing the right price signals and incentives.

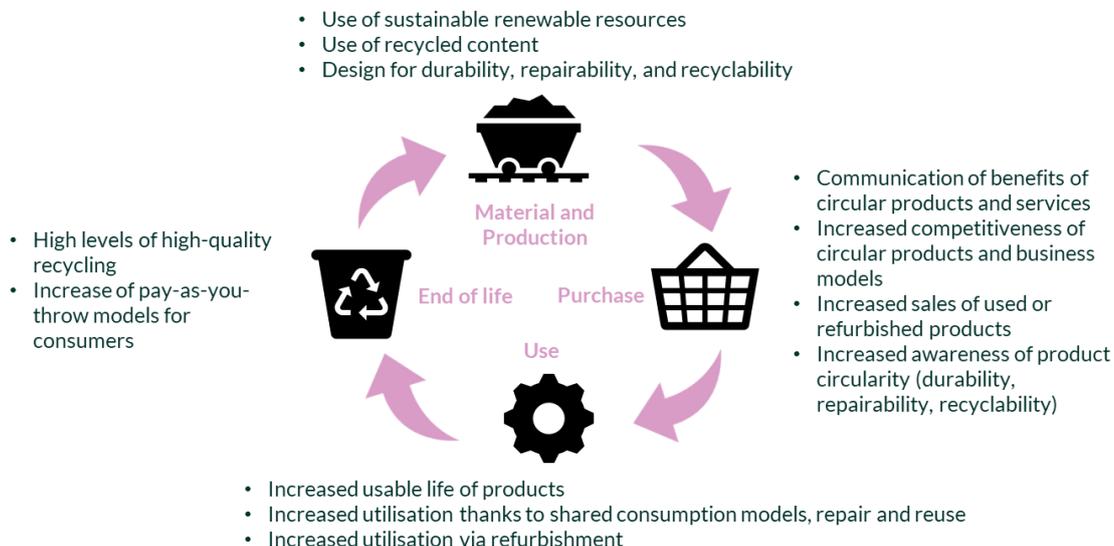
Effective circular taxation should **change the incentives a producer faces** at different stages of the product lifecycle. This should encourage the producer to make decisions that result in the production of more circular products (operating within circular systems). It should also **change the incentives a consumer** to shift towards the consumption

¹²⁶ Cambridge Econometrics, Trinomics, and ICF (2018), Impacts of circular economy policies on the labour market.; final report and annexes, Publications Office, 2018, <https://data.europa.eu/doi/10.2779/574719>

¹²⁷ While circular taxation could be used, other policy measures such as standards, minimum requirements, and/or fee modulation within EPR – individually or in combination – might be more appropriate.

of products that are more circular and/or the consumption of services provided by products through, for example, the use of shared products.

Figure 12 Summary of producer and consumer behaviour changes



- At the stage of **extraction of raw materials and production**, circular taxation encourages producers to consider how sustainable renewable resources can be used in the manufacture of their product and whether virgin raw materials can be replaced with recycled content. This should encourage a shift in behaviour towards the production and use of recycled or alternative materials/products. Additionally, the design phase is where many key decisions are made, and circular taxation should encourage design for durability, repairability, non-toxicity and recyclability.

- At the stage of **product purchase**, producers will need to consider how to communicate the circular benefits of their product to consumers, as this enables the producer to expand into new markets created by consumer demand for circular products. Circular taxation should help circular products and services be more competitive. Producers can also offer their products in alternative business models, as seen with the vehicle case study (Section 3.1.2). The purchasing stage is where consumers consider whether to buy a product or whether to opt for an alternative ownership model, such as renting or sharing. Additionally, if the consumer opts to buy a product, they are incentivised to consider whether to buy new or used. And if the consumer opts to buy a new product, consideration should be given to the characteristics that contribute to its circularity, such as circular production techniques, durability, repairability and recyclability.

- At the stage of **product use**, circular taxation can incentivise long-lived products. Therefore, the producer is encouraged to consider how the useful lifetime of their product can be extended and whether there is market for used or refurbished models of their product. Product taxes can incentivise longer usage of products by consumers, driving increased care of the product to prolong its usable life, including repair. If the consumer no longer wants the product, they are incentivised to consider donating or selling it for reuse (e.g. through tax reliefs).

- At the stage of **product end-of-life**, circular taxation should incentivise producers to achieve high levels of high-quality recycling, which can then be incorporated as recycled content. As regards consumers, circular taxation can help shift to pay-as-you-throw models which could further encourage more circular behaviours.

Influence between producers and consumers

Effective circular taxation should encourage producers to consider how to make their products in a more circular way and/or to devise alternative, more circular business models. As a result, **producers place products or services that are more circular on the market**. The availability of more circular products and services on the market can impact the **expectations of consumers**.

While the primary intention and effect of circular taxation is to use price signals to make circular products more financially attractive, the subsequent increased availability of circular products **raises awareness among consumers** that circular options do exist. Once consumers are aware of the negative impacts of linear products and realise that circular alternatives are available, they are more likely to demand circular products. For example, when a company places a product on the market with a significantly longer lifespan than the market average, it helps to shift consumer expectations and consumers begin to demand products with longer lifespans.¹²⁸

In parallel if **consumer demand for circular products** is increasing, it creates an opportunity for producers to expand into these areas of the market and so **producers place more circular products on the market**.

7.0 Conclusions

7.1 Circular Taxation

It is clear that the transition to a circular economy requires a prominent role for fiscal action and fiscal reform, which must adopt a more targeted approach. Fiscal instruments, of which circular taxes are a part, have great potential to shift our economies from linear to circular economies. A circular tax is the principle of applying a tax of sufficient magnitude that provides a clear price signal and brings about a certain level of behaviour change, leading to a reduction in both resource use and resource waste.

Circular taxes must play an increasingly prominent role in driving the circular economy forward, and be deployed across sectors and product categories. To date, much of policy debate has focused on a more traditional approach to environmental taxation, which is more limited in its scope and potential impact than circular taxation. Circular taxation, aims to contribute to a more radical change in the economic structure, significantly alter relative prices and significantly change extraction and consumption behaviour. The concept of circular taxation moves the discussion on from 'getting the prices right', which is the conventional aim of an environmental tax, to using taxation as an effective and efficient means of achieving specific societal objectives. Furthermore, circular taxes can bring about more socially just outcomes by shifting away from labour taxes, while taxing the use of scarce resources, product uses, waste generation, and providing tax reliefs for more circular activities.

Despite its huge potential as a fiscal tool, the concept of circular taxation is still in infancy. While there are a few examples of circular taxation available in several countries, barriers still exist for a more systemic implementation of circular taxation across Europe. This study has clarified how these barriers can be overcome through careful tax design, revenue recycling, extensive public participation and communications, and strict monitoring and enforcement.

¹²⁸ Fairphone (2021) Fairphone's Impact 2021: Change is in your hands. <https://www.fairphone.com/en/impact-report/>

Figure 13 Summary of design and implementation recommendations

Tax Rate	Stakeholder Support & Communication	Compliance, monitoring and enforcement	Use of Revenue
<ul style="list-style-type: none"> • Make purchasing new, linear products more expensive relative to circular alternatives • Use revenue collected from circular tax to invest in circular products • Adjust the tax rate once market has had time to respond • Increase tax rate over time • Avoid loopholes & adverse behaviour (exemptions) 	<ul style="list-style-type: none"> • Communicate the rationale and benefits of the circular tax • Announce the introduction of the tax in advance of the implementation date • Design the system to reinforce the emergence and adoption of alternative consumption patterns 	<ul style="list-style-type: none"> • Provide supporting infrastructure to avoid perverse behaviour • Ensure appropriate monitoring and enforcement including provision of funding • Ensure penalties are high enough to disincentivise non-compliance 	<ul style="list-style-type: none"> • Use in government general budget • Transfer the tax burden from labour to pollution and resources • Invest in advancement of circularity, via R&D and/or infrastructure • Mitigate negative distributional impacts

Widespread implementation of circular taxation across Europe can be further supported through tax coordination **across different markets** as well as shared responsibilities for the three levels of government to deploy these taxes. While the EU should set the appropriate framework, set ambitious environmental targets and minimum tax rates to incentivise Member States to make their taxes more circular, develop guidance, protect against tax avoidance, and provide oversight on the availability of alternatives and substitutes. However, with the current requirement of unanimity for setting any tax policy at the EU level under the special legislative procedure, it might be challenging to achieve unanimous agreement among all Member States. Moving to qualified majority voting under the ordinary legislative procedure will make it easier to implement a common circular taxation framework at the EU level. Member States can then retain the main competences (and hence responsibility) to deploy circular taxation in line with the EU level framework. Finally, the different cities and regions within the Member States can pioneer the implementation of different circular taxes through conducting pilot tax schemes or educating the public through positive media campaigns.

7.2 Recommendations for Further Work

Some recommendations for further work are presented here:

- Explore potential for EU level measures related to circular taxation. For example, how the EU could reform the Plastics Own Resource to make it more a more effective circularity instrument, or how the EU could set minimum tax rates for resource use and single-use items, or if an EU level target on resource use could encourage implementation of fiscal measures at Member States level;
- Conduct a market analysis to see which Member States are best fit to implement which circular taxes (i.e. Germany has a lot of manufacturing so they could implement production taxes vs other countries might be better fit to implement circular business models/other taxes);
- Advise countries on capacity building to support circular taxation deployment, identifying knowledge/infrastructure gaps, and areas to direct investment to help better guide the ring-fenced revenues;
- Advise the implementing of pilot schemes of various taxes (product sharing, PAYT) in cities that could be scaled up to Member States level.

8.0 Glossary

Acronym	Description
ALS	Area Licensing Scheme
B2B	Business-to-Business
B2C	Business-to-Consumer
CBAM	Carbon border adjustment mechanism
CE	Circular Economy
CLT	Cross-laminated timber
DRS	Deposit Refund Scheme
ERP	Electronic Road Pricing
EPR	Extended Producer Responsibility
EV	Electric Vehicle
GDP	Gross Domestic Product
MS	Member State(s)
P2P	Peer-to-Peer
PAYT	Pay As You Throw
PIT	Personal Income Tax
VAT	Value Added Tax
VED	Vehicle Excise Duty

