

**REDUCING  
RESOURCE EXTRACTION  
AND USE:  
PRODUCER  
RESPONSIBILITY  
FOR THE CIRCULAR  
ECONOMY**



## ABOUT THE AUTHORS

This paper was co-produced by an international consortium of organizations and individuals focused on realizing a circular economy and reducing our consumption of materials. The size of the group was determined by the need to facilitate co-production and membership was deliberately diverse, both geographically and across a broad range of expertise, to ensure that the process was robust.

We aim to foster discussion about innovative policy instruments, and how these can be aligned with existing policy frameworks, to address the global challenges of over-consumption and excessive resource extraction.

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**We would also like to acknowledge the contributions from Mark Hilton, Daniel Stunell and Dr. Chris Sherrington from Eunomia Research & Consulting Ltd, which took the form of comments and suggestions on early drafts of the report.**



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## PURPOSE OF PAPER

Humanity is facing a series of interlinked environmental and social crises that the United Nations (UN) has said could threaten the viability of our species. All of these crises are driven by our use of materials and the next decade is going to be pivotal if we are to avoid global catastrophe.

This paper articulates a new policy approach, focusing on internalizing a greater range of environmental and social costs and introducing targets to measure a reduction in virgin material use, with the primary mechanism for introduction being a new and more expansive type of producer responsibility, which complements the current application of Extended Producer Responsibility, or EPR.

As defined by the Organisation for Economic Co-operation and Development (OECD), EPR is “an environmental policy approach in which a producer’s responsibility for a product is extended to the post-consumer stage of a product’s life cycle [characterized by] the shifting of responsibility (physically and/or economically; fully or partially) upstream toward the producer and away from municipalities [and] the provision of incentives to producers to take into account environmental considerations when designing their products.”<sup>1</sup>

In summary, “While other policy instruments tend to target a single point in the chain, EPR seeks to integrate signals related to the environmental characteristics of products and production processes throughout the product chain.”<sup>2</sup>

As presented here, “Producer Responsibility for the Circular Economy,” could be transformational in accelerating our change to a circular economy by complementing EPR programs. These initiatives will be most effective and ambitious by adopting new and innovative approaches to producer responsibility, and ensuring alignment with a wider array of complementary measures.

Dramatically reducing material consumption and ensuring that materials are designed to flow back through the economy is key to addressing the environmental crises we face on climate change, biodiversity loss, and pollution.

Equally important, there is a social crisis which is compounded by unequal access to goods and services and distribution of the negative impacts from both industrial processes and the environmental crises we are facing.

The introduction of a circular economy can help bring us back within the environmental carrying capacity of the planet, but it also offers an opportunity to create a more just and equitable society.

To achieve this, it is vital that a holistic approach to policy development is adopted, looking not simply to avoid negative economic and social impacts in environmental policy making, but also to maximize the social and economic benefits through the use of incentivization.



# THE FOUR CRISES: CLIMATE CHANGE, BIODIVERSITY LOSS, POLLUTION, AND SOCIAL INEQUALITY

According to the Intergovernmental Panel on Climate Change (IPCC), the body tasked with providing governments with scientific assessments on global heating and the climate emergency, global greenhouse gas (GHG) emissions must fall by about 50% by 2030 from today's levels if the worst impacts of climate breakdown are to be avoided.

Doing so, and therefore limiting warming to 1.5°C, potentially protects “hundreds of millions of people from” being exposed to climate-related risks and susceptible to poverty.<sup>3</sup> The IPCC makes clear these impacts will not be felt evenly across the world: studies have repeatedly shown that disadvantaged and vulnerable populations are at “higher risk of adverse consequences with global warming,”<sup>4</sup> because these communities will be greatly impacted by extreme weather events such as drought, flooding, wildfires, etc. and have fewer resources for mitigation and adaptation, which decreases their resiliency.

This climate crisis is interlinked to two other global environmental crises - biodiversity loss and the collapse of ecosystems due to air, soil, and water pollution. The European Union estimates the annual loss in ecosystem services resulting from the cumulative loss of biodiversity will equate to 14 trillion (thousand billion) Euros by 2050,<sup>5</sup> which will be equivalent to 7% of the global GDP. More importantly, biodiversity has intrinsic value, and because its loss impoverishes society, we need to protect all species regardless of their value to ecosystem services.

All three environmental crises are being primarily driven by our use of materials. Over half of all GHG emissions are embodied in the things we consume.

These interlinked emergencies have been described by The United Nations Environment Programme (UNEP) as threatening our viability as a species. The urgency of action within the next decade is vital and the status quo is no longer viable.

**ALL THREE ENVIRONMENTAL CRISES ARE BEING PRIMARILY DRIVEN BY OUR USE OF MATERIALS. OVER HALF OF ALL GHG EMISSIONS ARE EMBODIED IN THE THINGS WE CONSUME.**



Therefore, much more effort is needed to reduce consumption of materials. The UNEP Global Resources Outlook 2019<sup>7</sup> report concludes that 90% of biodiversity losses globally are being caused by damage to the natural environment through resource extraction to create the products we consume.

## A FOURTH CRISIS WE MUST RECOGNIZE IS THE GROWING ECONOMIC DISPARITY BETWEEN THE GLOBAL NORTH AND SOUTH.

A fourth crisis we must recognize is the growing economic disparity between the Global North and South. The OECD data<sup>8</sup> indicates a significant and widening gap between the richest and poorest of the world, with associated social impacts.

This social crisis is underpinned by the environmental crises in two key ways. First, there is a significant disparity in resource consumption between the Global North and South, with the need to ensure equitable access to resources being vital to addressing social inequality. Secondly, compounding economic disparities in the Global South, the negative impacts of resource use in the Global North disproportionately impacts these communities.<sup>9</sup>

A clear and coordinated policy approach is needed to begin addressing these urgent and interlinked crises, which will require consideration of the full lifecycle impacts of the products we consume – from raw material extraction through the manufacturing and supply chain, lifetime use and disposal. The policy decisions made now have a direct impact on the extent to which we can mitigate catastrophic consequences for current and future generations.

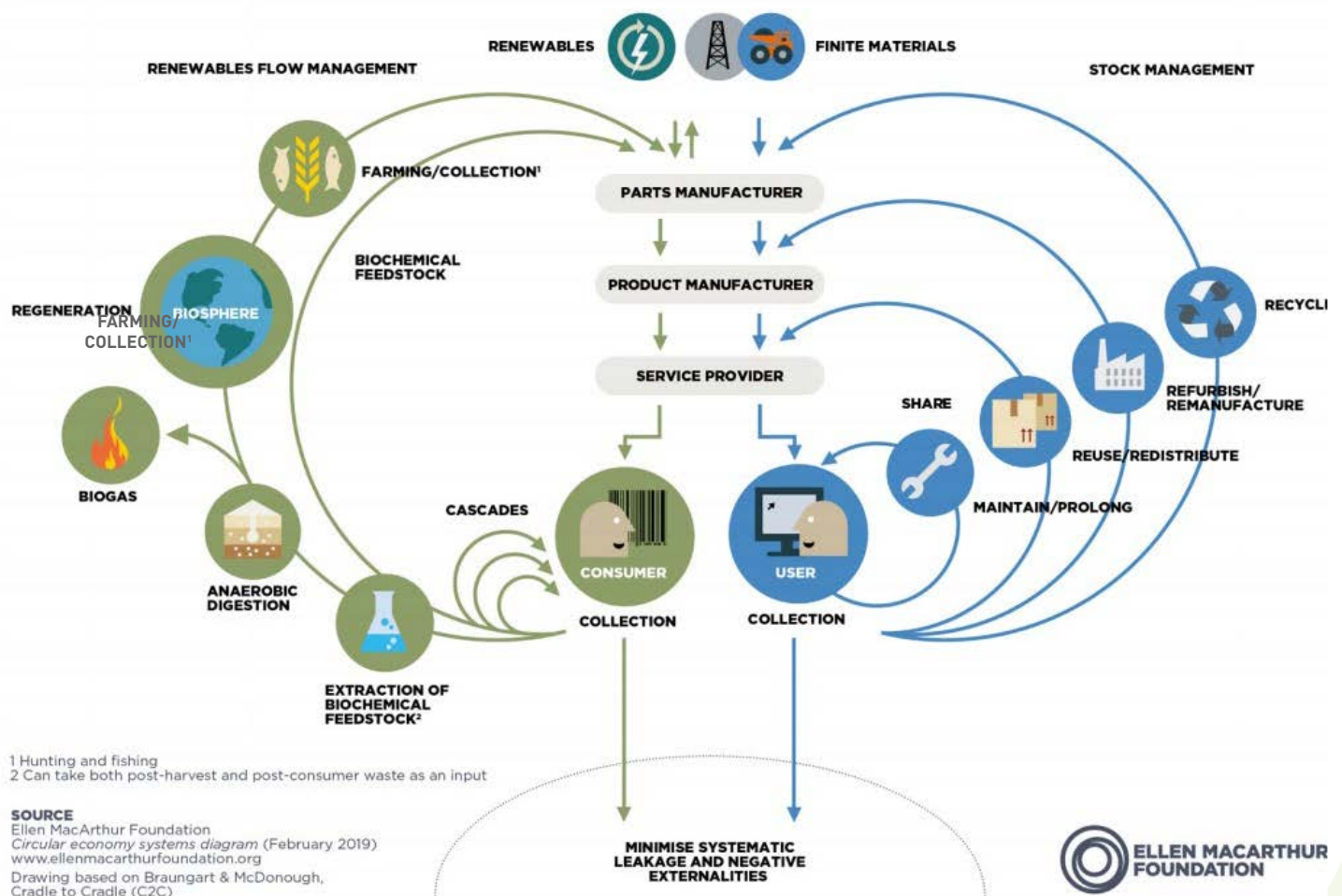


# THE ROLE OF A CIRCULAR ECONOMY

A circular economy replaces our “take-make-dispose” economic model with one that keeps materials and goods in use for as long as possible at the highest value use. This is achieved through a dramatic increase in activities such as increased durability of goods; removal of toxic materials preventing reuse; use of sustainably sourced materials; provision of services rather than goods; increased repair, reuse and high-quality recycling, which allows recovered material to replace virgin materials in the manufacturing process (see Figure 1).

In Making Peace with Nature,<sup>10</sup> UNEP highlighted that a circular economy allows us to end our war with the planet without giving up the benefits of modern life, and a report by Material Economics found that adopting circular economy strategies in five key sectors (cement, aluminum, steel, plastics, and food) could eliminate half of the current GHG emissions from the production of goods in these areas.<sup>11</sup> This is estimated to be equivalent to ~9.3 billion tonnes of CO<sub>2</sub>e in 2050, or cutting current emissions from all transport to zero.

**Figure 1** Ellen MacArthur Foundation Butterfly Diagram



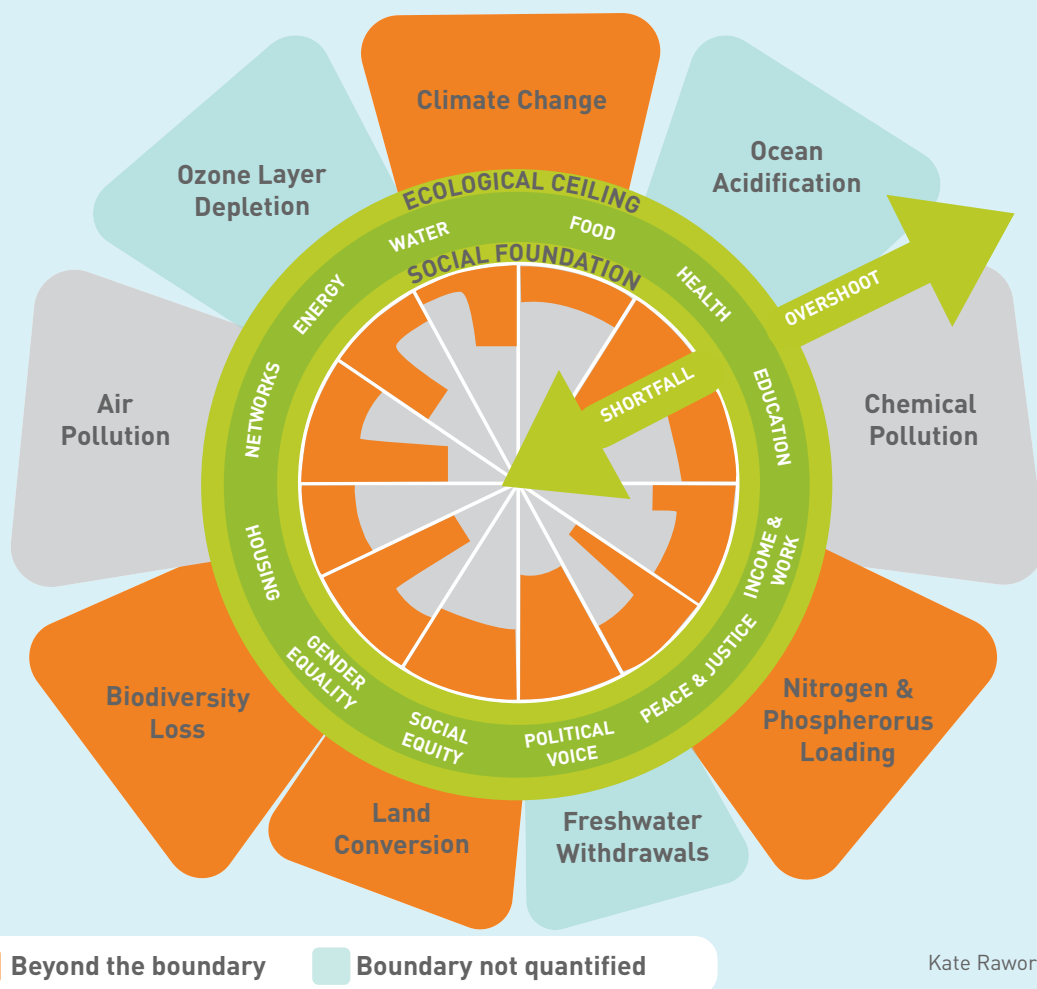
A circular economy presents opportunities to create jobs and grow new sectors both nationally and internationally, creating positive economic benefits while addressing environmental and social issues.

## BY RETHINKING PRODUCER RESPONSIBILITY WE CAN RESET MATERIAL FLOWS WITHIN THE ECONOMY SUCH THAT MATERIALS BROUGHT TO MARKET NOW HAVE AN INTRINSIC RATHER THAN A COMMODITY VALUE THAT FOLLOWS THEM ACROSS THEIR LIFECYCLE.

By rethinking producer responsibility we can reset material flows within the economy such that materials brought to market now have an intrinsic rather than a commodity value that follows them across their lifecycle. There is an opportunity to rebuild the economy, recognizing the scale and pace of change required, and provide direction and stimulus to maximize these benefits. We must also ensure new economic activity is socially just and equitable, and seeing this implemented will support similar action in established economic sectors.

In short, development of these new economic sectors presents a unique opportunity to move society back “inside the doughnut,”<sup>12</sup> reflecting Oxford economist Kate Raworth’s model where social foundations are provided within our one planet’s environmental limits (see Figure 2).

**Figure 2** Kate Raworth Doughnut Diagram



Kate Raworth



Many municipalities, regions, and nations have committed to circular economy strategies. Despite this effort, however, the world is becoming less circular. The Circularity Gap<sup>13</sup> report published by Circle Economy states the world was 8.6% circular in 2020, dropping from 9.1% two years previously.

The UN has indicated that a sustainable level of overall consumption of materials is an average of between 6-8 tonnes per person per year but current estimates show countries in the Global North far exceeding this threshold. For example, Scotland's Material Flow Account<sup>14</sup> indicates that each Scot used, on average, 18.4 tonnes of resources per person in 2017. In other words, the Global North has to more than halve its resource use to allow all nations to enjoy a high standard of living within planetary boundaries.



# INTRODUCTION TO EPR AND ITS ROLE IN CREATING A CIRCULAR ECONOMY

Extended Producer Responsibility (EPR) is widely recognized as a key policy instrument to help move towards a circular economy, but current applications have limitations. We consider the role of EPR in addressing the challenges outlined above and propose a new policy approach to maximize the effective elements of EPR, address current shortcomings, and accelerate the required reduction in production and consumption.

As referenced previously, EPR is defined by the OECD as: “An environmental policy approach in which a producer’s responsibility for a product is extended to the post-consumer stage of a product’s life cycle.”<sup>15 16</sup>

This means that responsibility for collecting or taking back used goods, sorting and treating those products, components, or materials for responsible reuse, recycling, or disposal, lies primarily with the producers who placed them on the market. Such responsibility may be financial, organizational or both. In line with the “polluter pays” principle, the costs associated with these activities are shifted away from taxpayers and municipalities and towards producers who sell the products.

EPR as a policy approach has evolved on a regional basis and detailed information is available from other sources if the reader is interested in researching this further. This includes the Product Stewardship Institute<sup>17</sup> in North America and the Extended Producer Responsibility Alliance (EXPRA)<sup>18</sup> in Europe.<sup>19</sup>

EPR programs have been very effective in transforming end-of-life waste management systems, moving away from residual disposal and growing markets for recycling of materials. Common features of existing EPR programs are performance targets, such as for collection, reuse, and recycling, to ensure that producers have a clear objective to aim for, as well as reporting requirements to provide data to regulators and governments which allows

assessment of performance and future direction.

## EPR PROGRAMS HAVE BEEN VERY EFFECTIVE IN TRANSFORMING END-OF-LIFE WASTE MANAGEMENT SYSTEMS, MOVING AWAY FROM RESIDUAL DISPOSAL AND GROWING MARKETS FOR RECYCLING OF MATERIALS.

As a waste management policy, EPR should therefore continue to play a key policy role globally as we look to introduce and continually improve end-of-life management. The reality, however, is despite 400+ programs operating globally, we still need a significant increase in more circular business models if we are to deliver the necessary transformation to a circular economy.

EPR is constantly evolving. In recent years, increased attention has been paid to the role that fee modulation can play in improving the design of products managed by EPR programs. This can be done by more granular and accurate calculation of fees for individual producers, so that those who have taken steps to lower the end-of-life cost impacts of their products pay less. This introduces dynamic incentives to change, where the fees paid by the producer are varied according to specific criteria relating to their products’ environmental performance. In theory, the more “environmentally-friendly” or resource efficient products can be charged at a lower rate to incentivize a market shift towards sustainable product design (eco-design).

Since the application of such “eco-modulated fees” in EPR programs is a relatively recent development, it remains to be seen how much they will effectively support a shift to a more circular economy. However, even with the advent of these financial drivers within EPR, a number of organizations and individuals, including contributors to this report, recognize there are opportunities to go further.

Currently, the main targets are typically focused on optimizing a very direct end-of-life outcome (e.g. recycling measured by tonnage). Yet, recycling in isolation is a poor measure for ensuring an offset of virgin materials and does not measure any of the other activities which contribute to a circular economy, or which allow us to live “within the doughnut.”

## RECYCLING IN ISOLATION IS A POOR MEASURE FOR ENSURING AN OFFSET OF VIRGIN MATERIALS AND DOES NOT MEASURE ANY OF THE OTHER ACTIVITIES WHICH CONTRIBUTE TO A CIRCULAR ECONOMY, OR WHICH ALLOW US TO LIVE “WITHIN THE DOUGHNUT.”

Additionally, it is necessary to ensure that the right range of costs are captured to ensure businesses include these in decision making and that targets drive the right outcomes.

Although EPR incorporates a “polluter pays” mechanism, the costs of preventing negative impacts are not yet fully internalized since the assessed “net costs” primarily relate to the waste management costs at end of life, which are typically a portion of actual costs imposed on society by the products themselves. If such costs are incorporated in EPR, it is a much more powerful tool; if they are not, it is essential to consider how EPR works alongside other policy measures to deliver economic incentives to producers that drive rapid change at scale.



## PROPOSED POLICY APPROACH

Producer Responsibility for the Circular Economy could play a pivotal role in accelerating the transition to a circular economy and help to avert the four environmental and social crises identified. To do so, it must address the points above of internalizing the necessary range of costs to support business decision making and establishing appropriate targets to measure success.

## PRODUCER RESPONSIBILITY MUST ALIGN TO A WIDER POLICY FRAMEWORK AND SUPPORT THE TRANSITION TO A CIRCULAR ECONOMY.

Producer responsibility must align to a wider policy framework and support the transition to a circular economy. The rationale for recommending producer responsibility as the correct policy tool to implement these changes is that many of the features of this type of policy, when well delivered, are still extremely powerful.



## Features of effective producer responsibility

-  **Placing greatest responsibility for change on the point in the supply chain – producers – with the greatest leverage to implement efficient and effective changes to their products and the way they move through our economies.**
-  **Allowing governments to specify the change required, ensuring clarity on expected outcomes.**
-  **Providing flexibility for producers to deliver the outcomes set by government, using the strength of the market to drive innovation and promote competition.**
-  **Allowing interventions to be designed and targeted to product category or sector level.**
-  **Gathering performance data to assess program impacts, and reassessing performance targets over time.**
-  **Strengthening existing EPR programs through updated performance targets and modulated fees, and expanded to incorporate complementary policy approaches.**
-  **Expanding fee modulation to incorporate the full costs of consumer goods and materials – upstream and downstream.**
-  **Ensuring EPR schemes complement and amplify a broader policy landscape aimed at driving circularity, such as the European Commission's Sustainable Products Initiative.**
-  **Enabling opportunities to learn from successful system implementations and use existing networks to share developing best practice.**

The transition to a circular economy will create social and economic opportunities as well as risks. In this paper, we outline the need for a holistic policy approach, incorporating social and economic considerations to maximise the positive and minimise the negative impacts.

As already indicated, delivering appropriate targets, internalising costs for producers, and achieving the vision of a social and economic transformation will not be achieved by EPR alone, even if it is used much more effectively and ambitiously.

Producer Responsibility for the Circular Economy also means aligning clearly with complementary policy measures to deliver these aims. In some cases, other measures may not require producer responsibility at all (e.g. restrictions on single-use items with alternatives available). However, we envision bold producer responsibility as a critical component of the policy framework that supports the transition to a circular economy.



## Reflecting the true costs of products

**There is a need to internalise a much broader range of costs associated with the environmental crises. This would include accounting for the impacts of economic activity on climate change, biodiversity loss, human toxicity, land use, and particulate matter.**

There is a need to internalise a much broader range of costs associated with the environmental crises. This would include accounting for the impacts of economic activity on climate change, biodiversity loss, human toxicity, land use, and particulate matter. Some of these indicators already have internationally recognised, peer-reviewed methodologies for quantifying impacts financially.<sup>20</sup> Others would require further work to establish these costs, or require that we accept a greater degree of uncertainty. These impacts have a much larger economic cost than is reflected in “waste management” costs alone and are not accounted for directly or indirectly in conventional EPR schemes. In the absence of other measures these costs are largely borne by wider society and governments across the globe.

Internalising these costs would create the necessary financial incentive for producers to adopt more circular, resource-efficient business models. Without bringing them “onto the balance sheet,” our current economic model assumes they are a free resource, significantly contributing to our overshoot on planetary limits.

We have seen this failure environmentally (e.g. ozone depletion, hazardous chemicals) and socially (e.g. health & safety, workers’ rights, overall community amenity), where government action was required to achieve change by internalising an impact imposed by private business.

We propose that these full additional costs are only allocated initially to producers where targets are not met i.e. high-performing sectors which achieve required targets are not penalised unnecessarily. This should act as a strong incentive for industry to invest in the necessary measures to meet targets in the most cost-effective way, and prevent excessive cost pass through to consumers.

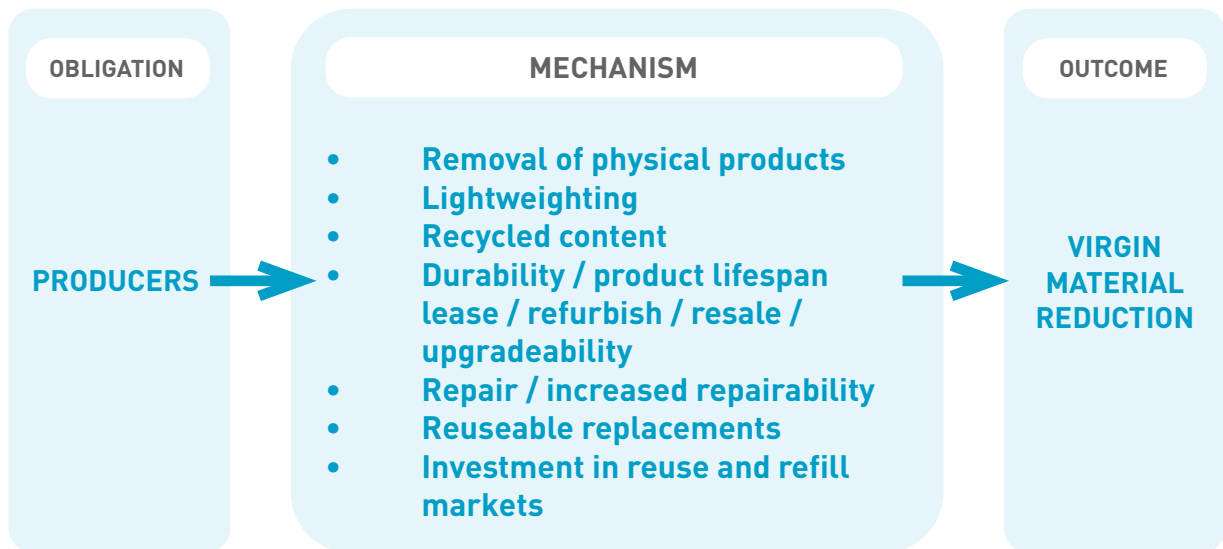
This does not mean targets are static, and they should set ambitious performance standards. Once costs are internalised, this can motivate competition and innovation by companies that will compete to remove as much of that cost as possible through the adoption of more circular, resource-efficient business models.

A concerted effort to minimise costs will assist entire sectors or product categories to realise economies of scale which otherwise wouldn’t be possible.

This would address the environmental and social crises we have highlighted while allowing for local or national adaptations in policy approaches.



## Require a virgin material reduction target



A new type of performance target is also required to drive change. Recycling targets do not ultimately measure all of the critical outcomes. One key objective, and a good measure of circularity, is reduced use of virgin material. We cannot increase material extraction to offer a higher quality of living to everyone on the planet as we are already significantly overshooting environmental limits.

### A COMPELLING TARGET FOR MANY PRODUCT TYPES WOULD BE A REDUCTION IN VIRGIN MATERIAL USE PER INDIVIDUAL ITEM PER YEAR.

A compelling target for many product types would be a reduction in virgin material use per individual item per year. To meet this target, businesses would have to pursue the activities in the inner loops of the Ellen MacArthur butterfly diagram (see Figure 1), though they might do so in different ways. For example, one company could increase the amount of recycled content in a product or package and displace virgin material content.

Other companies could achieve the target by increasing the durability of goods,

providing a longer guarantee, investing in repair facilities, adopting lease models, implementing consumer-repairable designs or increased takeback schemes, promoting refillable systems, and other actions. Some approaches might not decrease virgin material use at the manufacturing stage but would spread the resource intensity over a greater number of years, resulting in an overall decrease, as items last longer.

### AS A BROADER TARGET, PRODUCERS WOULD HAVE FLEXIBILITY TO DECIDE ON THE MOST EFFICIENT AND EFFECTIVE WAY FOR THEM TO DELIVER THE REQUIRED REDUCTION.

As a broader target, producers would have flexibility to decide on the most efficient and effective way for them to deliver the required reduction. This would deliver the identified benefits in as low-cost a way as possible rather than governments dictating a single response. However, targets should be specified to avoid unintended consequences in our complex and interrelated environmental systems.



# ADDRESSING SOCIAL AND ECONOMIC INEQUALITIES

Increasing social inequality is linked to, and magnified by, the identified environmental crises and our use of resources. A shift to a circular economy offers an opportunity to address this crisis if social and economic policy considerations are integrated into the development of this new policy approach.

The shift to a circular economy will create new sectors and increase existing ones as new business models are adopted. This should include more durable products, as well as associated repair and remanufacturing facilities that produce and use high quality recycling outputs. This could support a local economic transformation as new repair hubs offer employment opportunities or formal recognition of the contribution of the informal waste sector. Additional shifts from single-use plastic to a focus on refilling might also require an increase in jobs to service third-party sanitising systems that will build new reusable sectors.

By acknowledging this potential, and intervening at a sector or product level, governments can identify and shape where and when these opportunities arise. They can plan and invest economically and socially to support them. For example, investment in significant infrastructure could be incentivised in areas with high unemployment, or performance requirements could include supply chain standards to be specified, capturing social as well as environmental benefits.

Just as the health and environmental risks of the three environmental crises affect the poorest and most disadvantaged communities the most, tackling these crises should most benefit these groups, as they are much more likely to directly suffer the negative consequences of climate change, pollution and biodiversity loss.

Gupt and Sahay<sup>21</sup> explored an example of this in a paper on options to improve the management of batteries in the informal waste sector in India. The report identified how the reprocessing

of hazardous material could be undertaken in certified compliant facilities, removing unprotected exposure to hazardous substances, while still providing a key role for the informal sector in collection and transportation to avoid unintended negative social consequences.

The shift to a circular economy will deliver significant benefits that far outweigh the costs of the transition. However, this will not occur unless there is a mechanism to transfer the true costs of products to the producers. One potential risk is that consumer costs could increase, with potential negative impacts on poorer and disadvantaged groups. This would represent an unacceptable social impact.

In economic terms this is referred to as “cost pass through” and the extent to which it occurs is dependent on the net cost to business of adapting business models and the elasticity of demand for products relative to supply.

Under current Packaging EPR programmes, which have been operating in Europe for the past 35 years, EXPRA has confirmed that producers found no noticeable increases in costs to consumers from these EPR programs.

The other factor that plays a role is the level of product differentiation. Cost pass through will be different for each product category and in different markets. It is also difficult to estimate since the proposed target design allows producers flexibility to choose a variety of approaches to achieve the desired outcome and the most attractive or cost-effective option will vary from producer to producer.

Any potential cost pass through should therefore be dependent on the costs of options chosen by producers to achieve the target minus the benefits derived from the new business models. This can be influenced by the setting of the target, the visibility of long-term trends and the length of time provided to achieve targets.

Recognising risk is essential to ensuring that the consideration of social impacts is built into macro-policy design. Social impacts can be mitigated through steps to ensure a smooth transition, supporting small businesses, groups and/or individuals to offset upfront costs that may be unaffordable, implementing new business models at scale, and providing the public with access to information and training.

Similarly, there are also risks associated with sectors that are negatively impacted domestically or supply chains that are impacted internationally. Mitigation measures might include changes to taxation to reduce labor costs, supporting a focus on higher quality and higher margin products fit for the circular economy, and attracting new economic opportunities into regions impacted by the exit of “sunset” industries.

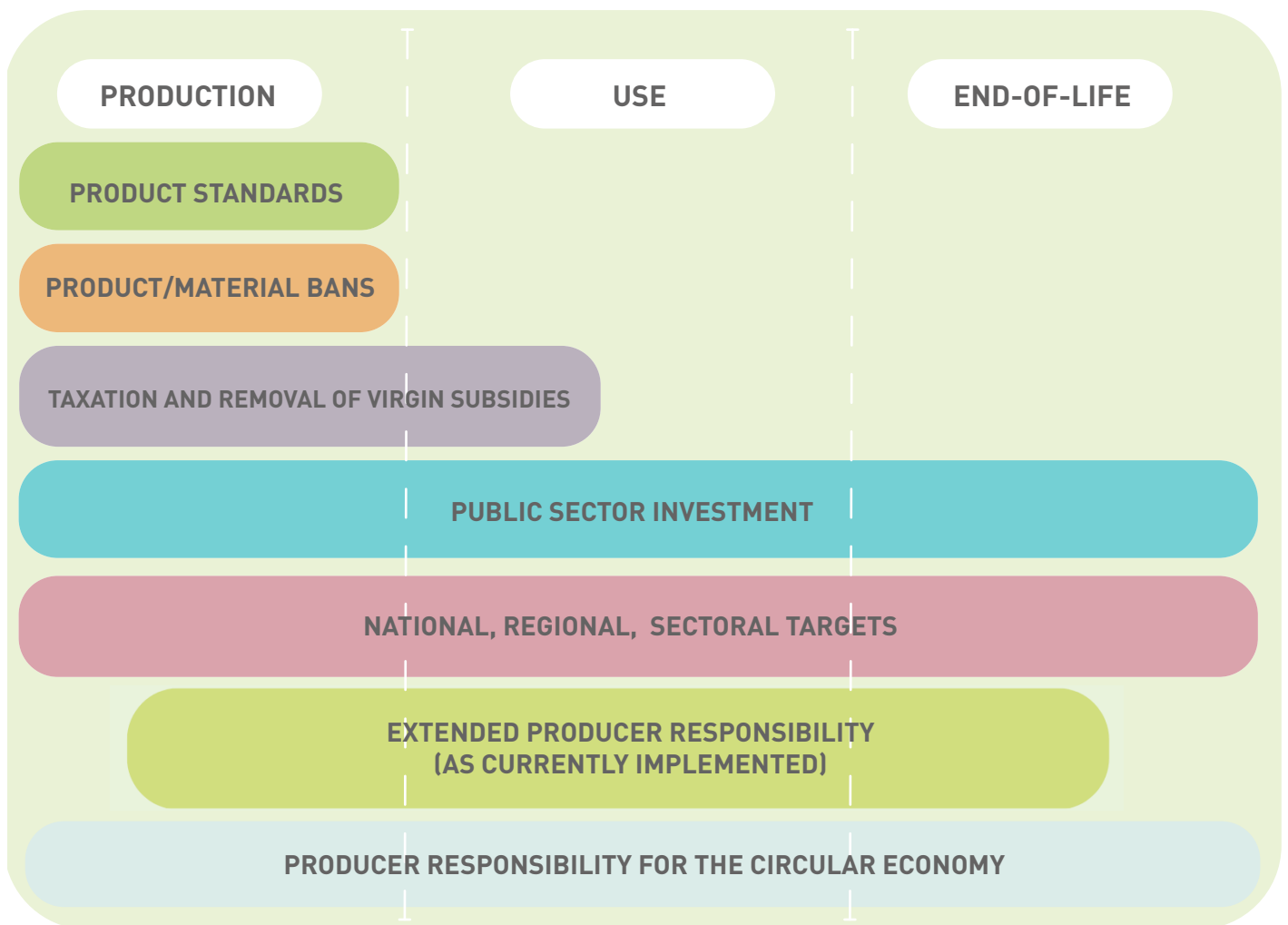
Implementation of these measures allows the focus to be placed on the benefits of reducing material extraction in order to reduce the pressure on those communities. These could include establishing sourcing standards that ensure remaining extraction is done responsibly, as well as end-market standards for recyclables and reuse, which prevent the dumping of unwanted residual waste.

**THE ROLE OF POLICY, THEREFORE, IS TO MANAGE THE TRANSITION TO A SITUATION WHERE FAR FEWER PRODUCTS ARE CONSUMED, BUT THOSE NEW PRODUCTS ARE OF MUCH HIGHER QUALITY, ARE MORE DURABLE, HAVE HIGHER USAGE RATES, AND ARE AFFORDABLE TO THOSE ON LOWER INCOMES.**

The role of policy, therefore, is to manage the transition to a situation where far fewer products are consumed, but those new products are of much higher quality, are more durable, have higher usage rates, and are affordable to those on lower incomes. It is important that the supporting policy interventions are well designed to bring about a smooth, but rapid, transition through enabling the establishment of more circular, resource-efficient approaches.



# WIDER ENVIRONMENTAL POLICY FRAMEWORK



We have detailed the need to consider the wider social and economic opportunities and risks created by this new policy approach, some of which can be addressed within the EPR system and some that may require separate policy interventions.

Likewise, it is important to recognise that no single policy can address all of the changes required to successfully transition to a completely circular economy. It is not just about improving existing EPR schemes or the introduction of a new producer responsibility approach; it is also about aligning them with wider policy, and aligning wider policy with producer responsibility, so that they are mutually supportive in pursuit of the goals that we seek as a society. Where one measure reaches its limits, another must take its place.

With this in mind, it is important to consider the wider policy framework and what other measures could complement the aims of ensuring costs are appropriately internalised, and benefits and opportunities are appropriately distributed to drive the required changes, meet targets, and ensure progress is assessed accurately.

The exact “policy mix” in each geographical area is likely to be influenced by the existing policy landscape and broader economic and social factors. With this report, our intention is not to provide a detailed description of all the policies required but instead highlight those which are likely to have a role in most areas, to encourage further reading.

## Minimum Requirements and Product Standards

The minimum requirements that producers must meet to sell their products and packaging are a key supporting mechanism and vital for a cohesive strategy to reduce material consumption. These requirements set broad standards to protect the environment and human health, and seek societal outcomes that lead to healthy communities. Products and packaging that do not conform to these minimum requirements should then be banned or priced out of the market.

This approach can be seen in the EU in the development of mandatory cross-cutting minimum requirements as part of the Sustainable Products Initiative (SPI).<sup>22</sup> This will revise and broaden the Ecodesign Directive, currently focused on energy related products, which aims to make products placed on the EU market more durable, reusable, repairable, recyclable, and energy efficient. Another example is the U.S. Toxics in Packaging Law,<sup>23</sup> currently adopted by 19 states. This law prohibits the intentional inclusion of four classes of restricted heavy metals, such as mercury and cadmium, in consumer packaging.

To achieve a circular economy, we also need to move products and packaging up the waste hierarchy. Durability and repairability are fundamental characteristics for products to have a long life for single or multiple owners. In product groups where durability is more difficult to define and test, such as electronics, minimum free manufacturer's warranty periods could be defined to ensure that product quality is not compromised. Repairability can be guaranteed by the requirements for simple disassembly and reassembly alongside the availability of parts.

## Incentivisation Through Taxation and Removing Virgin Material Subsidies

Taxation provides another way to internalise costs or change where the balance of costs resides. This could include taxation of virgin materials as a mechanism to influence large swathes of the economy without having to establish specific programs to do so.

An example of this is EU ratification of a tax for non-recycled plastic packaging in May 2021.<sup>24</sup> Other well-established incentives include the provision of tax credits for businesses to make significant investment in the development of skills and training.

A broader review of how the existing tax regime does or does not support circular business models will also identify significant changes that are necessary to support a true circular economy such as the removal of subsidies for extraction of carbon intensive resources, or weighting taxation towards use of materials rather than labor. The revenues from taxation can then be used to address wider issues within the system, such as reducing social inequality.



## EPR

As discussed, EPR will continue to have a vital role in the policy landscape in addressing end-of-life waste management issues for materials and products. A number of components of high functioning EPR programs would also help in achieving the proposed virgin material extraction goals, such as eco-modulated fees that incentivise reuse and closed-loop recycling.

Depending on local circumstances and legislative requirements, the approach described here could be implemented to evolve existing EPR systems rather than establishing new ones. This would have the benefit of taking advantage of existing structures to prevent duplication and support quicker implementation.

There remain opportunities to improve the effectiveness of EPR for delivery of its current benefits. The most recent revision of the EU's Waste Framework Directive, for example, establishes general minimum requirements for EPR programs in Article 8a,<sup>25</sup> which intend to increase the effectiveness of system implementation. Recently published guidance elaborates on best practices for program implementation in several key areas.<sup>26</sup>

Other aspects of EPR governance and policy making that can be improved include a need to provide greater certainty about which products are likely to be regulated, and greater visibility and ambition about the necessary pace of performance improvements needed over the next decade. There could also be greater cross fertilisation of ideas and policy expertise, which will more effectively manage the development of multiple EPR systems. Solutions adopted here are likely to be transferable to "Producer Responsibility for the Circular Economy" systems if implemented separately.

### Public Sector Investment

A number of facets of public sector investment could be used to play a key role in driving the innovation required to facilitate truly circular solutions across the economy. Public sector support in research & development (R&D) has

delivered key innovations in the past in areas as diverse as development of the internet and access to space. A similar "moon-shot" approach, which recognises the ambition of the goal and change required (while avoiding false solutions), will be vital in developing new materials and business models.

This will include areas such as R&D, training and skills, education, investment capital, public sector procurement alignment, and supporting public behavior change.

Support will also be required in legislating the necessary changes in standards and regulations to facilitate implementation.

### Product/Material Bans

Governments have the legal authority to restrict the sales of specific products and services within their boundaries. We have seen this used significantly to ban single-use plastic items due to public backlash against the leakage of plastic into marine environments. Some governments have gone further, banning the use of single-use items of all types of materials in specific settings. For example, Taiwan<sup>27</sup> has banned single-use cutlery when sitting in restaurants. As circular business models become the norm, it could become feasible to completely restrict the use and sale of single-use items onto the market. However, such restrictions will need to be considered carefully in the context of equity, for example ensuring exemptions for individuals who are disabled if they are significantly disadvantaged by the restriction.



## National, Regional, or Sectoral Targets

Virgin material reduction has been identified as a key metric for assessing progress towards a circular economy, and we have outlined how this could work at a product or sector level to drive change. It is also necessary to understand progress against this at a national level, so key sectors can be identified and targets established relative to an overall ambition.

Some national governments, such as the Netherlands,<sup>28</sup> have set such targets. One of the risks of this approach, in isolation, is large volume or heavy, but low carbon, materials (such as soils from construction and demolition) will determine progress against such targets. In other words, the tonnage reduction in material weight may not generate the environmental benefit desired. We suggest greater granularity and accountability is required, assessing at least at a material level, to ensure appropriate prioritisation of interventions.

## Partnership Approaches

Industry forums and sectoral agreements can be effective when part of a wider regulatory and policy framework that provides “carrot and stick” incentives to act. In particular, they can enable industry to identify optimal pathways to clearly set policy goals in advance of regulation, co-create standards, and provide invaluable technical insight to inform smarter policy making.



## CALL FOR ACTION

The 2020s are a key period that will define the wellbeing of our planet and species for generations. We face interlinked environmental and social crises that are driven by our use of materials and can be addressed by a shift to a circular economy.

We need transformational change to accelerate this transition during this critical period. This paper proposes an approach based on internalising a greater range of environmental costs to incentivise the necessary change, and introduction of new types of targets, to ensure progress is monitored and delivered.

## THE PRIMARY MECHANISM FOR REALISING THIS APPROACH IS A NEW APPROACH TO PRODUCER RESPONSIBILITY, ONE WHICH INCORPORATES TWO KEY FEATURES: A REDUCTION IN VIRGIN MATERIAL TARGETS AND INCORPORATING ENVIRONMENTAL COSTS BEYOND END-OF-LIFE WASTE MANAGEMENT.

The primary mechanism for realising this approach is a new approach to producer responsibility, one which incorporates two key features: a reduction in virgin material targets and incorporating environmental costs beyond end-of-life waste management. Complemented and amplified by a comprehensive policy framework, we believe this can drive the type of transformation required.

By recognising the economic and social opportunities and risks associated with this economic shift, programs can deliver a just transition, address disparities between the Global North and South, and help deliver priorities across the UN Sustainable Development Goals.<sup>29</sup>

This will only happen if a comprehensive policy approach is adopted that places realising social benefits, rather than simply preventing further harm, as a core objective. Some of these opportunities will be found through integration into environmental policies and others will be realised by conditions created by those policies.

The next step is to work with interested parties to develop and test this approach. This work will be influenced by the wider policy landscape, products to be covered, and wider economic and social circumstances. We will undertake further discussion and engagement following publication of this report and are eager to hear from leaders in the circular economy who are interested in working with us as we enter this next phase.



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<sup>16</sup>It should be noted that definitions of EPR vary by organisation, geography and aims. For example, the Product Stewardship Institute defines EPR as a mandatory type of product stewardship that includes, at a minimum, the requirement that the manufacturer's responsibility for its product extends to post-consumer management of that product and its packaging. There are two related features of EPR policy: (1) shifting financial and management responsibility, with government oversight, upstream to the manufacturer and away from the public sector; and (2) providing incentives to manufacturers to incorporate environmental considerations into the design of their products and packaging.

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<sup>19</sup>The Product Stewardship Institute defines EPR as a mandatory form of product stewardship, which is defined as, 'The act of minimising the health, safety, environmental, and social impacts of a product and its packaging throughout all lifestyle stages, while also maximising economic benefits. While sometimes mandatory, product stewardship can also be voluntary, which is a key difference from EPR. <https://productstewardship.us/what-is-epr/>

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