The Circular Economy

Micro–Macro Linkages and Implications for Commonwealth Countries

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MICRO-MACRO LINKAGES AND IMPLICATIONS FOR COMMONWEALTH COUNTRIES

The Commonwealth

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1. Rethinking the path to prosperity

In the ongoing fight against poverty and inequality, globalization and sustained economic growth are perceived as key to ending global poverty and achieving the Sustainable Development Goals (SDGs). Sustained economic growth is traditionally seen as leading to increased income, which either directly or indirectly lowers poverty levels. Similarly, as the world becomes more globalized, it is assumed that the increase in trade will be accompanied by good quality jobs in both industry and services and, consequently, increasing income, declining poverty and sustained growth.

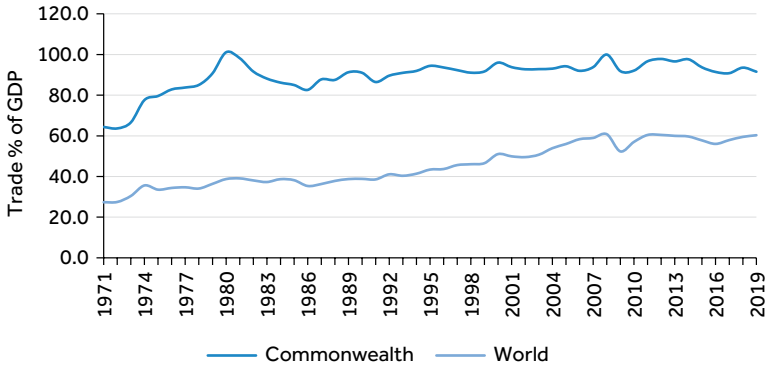
Indeed, over the last three decades, global trade more than doubled from 27.3 per cent of gross domestic product (GDP) in 1971 to 60.3 per cent in 2019. The numbers are much higher for Commonwealth countries, largely driven by small states (Figure 1.1).

Similarly, global economic output more than doubled. A sample of 174 countries shows that collective GDP increased from USD 32 trillion in 1996 to USD 84 trillion in 2020 (Figure 1.2). Meanwhile, within the Commonwealth, GDP nearly tripled from USD 3.8 trillion to USD 11.3 trillion over the same period.

However, while the increase in globalization and sustained global economic growth achieved the desired outcome, with global poverty headcount ratios at USD 1.90 a day declining from 36.2 per cent of the global population in 1990 to 9.3 per cent in 2017, production placed increasing strain on natural resources, with adverse effects for the climate.

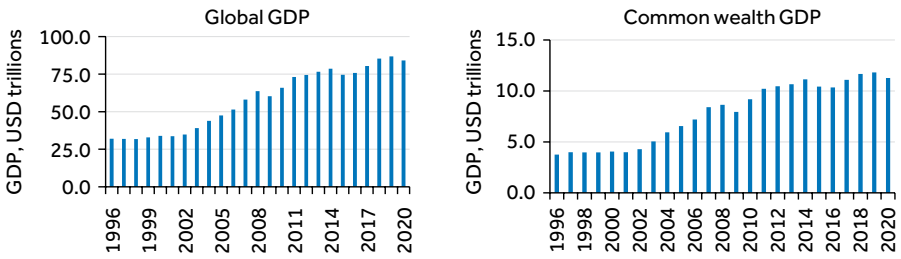
These climate-related pressures, which include the increasing intensity and frequency of weather-related shocks, have the potential to undo the gains

Figure 1.1: Global trade more than doubled over the last five decades



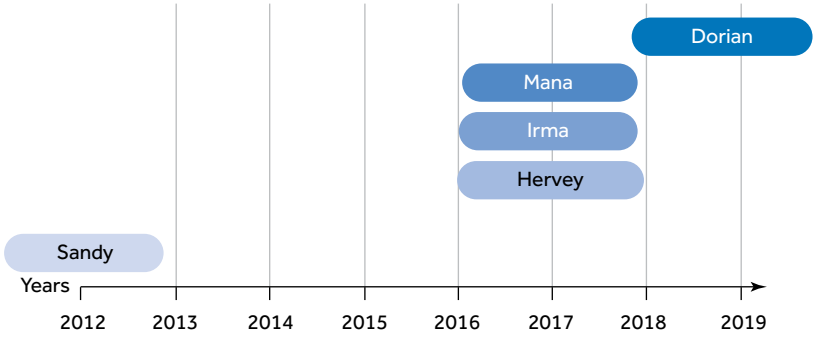
Source: World Bank (2022).

Figure 1.2: The global economy more than doubled in two and a half decades



Source: International Monetary Fund (2022).

Figure 1.3: The five most destructive hurricanes (2012-2019)



in poverty reduction. Within the Commonwealth, for example, Caribbean small states are locked in a climate vulnerability cycle that threatens lives and livelihoods and has adverse impacts for the natural environment. In the graph below, we can see a large gap between hurricane Sandy in 2012 and the three hurricanes in 2017. However, in 2017 there were three Category 5 hurricanes in just one year, while the next hurricane of similar intensity came only two years later in 2019 (Figure 1.3). Meanwhile, East and Southern African countries have recently experienced three-year cycles of droughts and floods.

Advanced Commonwealth states have not been spared either. In 2020, extreme drought in Australia led to bush fires of unprecedented intensity that caused catastrophic damage.

2. A race against time: The limits of linear consumption and why the time to act is now

The current linear economy is based on converting natural resources into waste via the manufacture of products for consumption, deteriorating the environment (Garcés-Ayerbe et al. 2019). This take–make–dispose philosophy places a strain on natural resources and produces large amounts of waste (Figure 2.1).

During the earlier industrial stages of developed countries in the West, there were no serious limitations to production. Raw materials were easily available and there was the possibility to constantly improve and optimise new technologies, making the linear model widely accepted. This model was considered a way to grow production, employment, profit and standards of living and to continue to grow the demand for all types of goods.

However, the linear model has been criticised and challenged by governments and society for the way that it treats nature as an industry, leading to negative global impacts such as increasing CO_2 emissions, global warming, scarcity of and permanent damage to natural and non-renewable resources and pollution of soil and water. Research published by the United Nations Environment Programme (2016) shows that primary resource extraction amounted to around 22 billion tons in 1970, including materials such as fossil fuel, metals and timbers. This ballooned to roughly 70 billion tons in 2010. If extraction continues at this rate, 180 billion tons of material will be needed annually by 2050 (Upadhayay and Alqassimi 2019).

The limits of the linear model have been exposed, with many companies noticing increased exposure to risk. They feel trapped between volatile prices in resource markets on the one hand and high competition and stagnating demand for certain sectors on the other (WEF 2014). Several other areas also reveal these limits, including the fact that in manufacturing processes, the opportunity to increase efficiency exists but is mainly incremental, with no possibility to create a competitive advantage or differentiation (ibid.).

In addition, agricultural productivity has slowed, soil fertility is declining and the risk to supply security and safety associated with long, optimized global supply chains appears to be increasing (World Economic Forum 2014). Finally, production sites with excessive requirements for virgin resources such as water, land or the atmosphere are struggling to renew their licence to operate as they compete in sensitive resource markets (Ellen MacArthur Foundation 2014).

Going forward, global trends will entrench the deterioration of the potential of the linear economy. These trends can be classified in four key strands: demand side, supply side, trade and policy.

Demand side trends include:

- Demographic changes in emerging markets such as China and India will increase the global mass of middle-class consumers

Figure 2.1: Linear economy flow diagram

Source: Adapted from Upadhayay and Alqassimi (2019).

by an estimated 3 billion with increased corresponding consumption (Dobbs et al. 2011).

- As enablers of a new system come into play, the adoption and scale of the circular economy will be accelerated. For example, consumers are moving away from having ownership of products towards a preference for accessing products, i.e., services, therefore moving the economic model away from a linear system (World Economic Forum 2014).

Supply side trends include:

- More infrastructure will be needed for companies to reach harder-to-access resources as they become scarcer.
- Stark and lasting resource price increases will occur as well as unprecedented resource price volatility, with higher price volatility for metals, food and non-food agricultural output than in any single decade in the 20th century (Dobs et al. 2011).
- Continued pressure on finite resources as firms will struggle to maintain high quality with existing stock of materials as different resources such as gold, silver and tungsten reserves are depleted (Hunt 2013).

Global trends in relation to trade include:

- Globalized markets and an interconnected world, which relies strongly on a rapid global flow of people, goods and information, mean that regional price shocks can quickly become global (Ellen MacArthur Foundation 2013).

Policy trends include:

- Governments have begun to provide support and stimulus for moving away from the linear system towards a circular model. At the European Union level, this includes Member States increasing landfill costs for construction and demolition waste, boosting the reuse and recycling rate of concrete, timber and other construction materials (European Commission 2013).

The circular economy (CE) approach aims to avoid waste and the consumption of finite resources through the 3Rs: reduce, reuse and recycle. A combination of increasing resource prices, scarcity and volatility coupled with enabling factors will mean that businesses that extract value from resources being wasted will reap higher rewards, whereas those with the take-make-dispose philosophy will likely find their economies of scale less profitable and will be left behind in the wake of innovators.

3. COVID-19 presents an opportunity to adopt the circular economy: A crisis not wasted

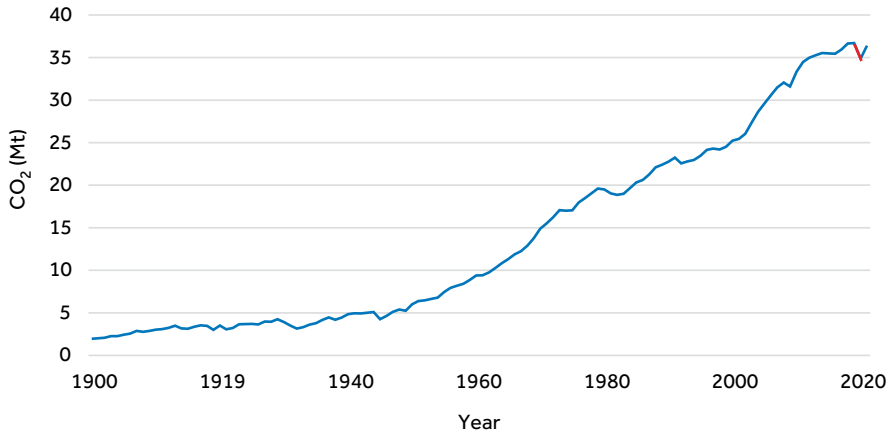
The COVID-19 pandemic has revealed many vulnerabilities within both supply chains and global production across the world. It highlighted the limited ability to contain and adapt to the systemic risk due to our highly interconnected world (Ellen MacArthur Foundation 2020). Consequently, it has instigated a focus on local manufacturing as a way of building a resilient economy and enable job creation, fostering behavioural change in consumer patterns as well as triggering the need for diversification and circularity of supply chains (Ibn-Mohammed et al. 2021).

During the strict lockdown measures put in place, the positive effects of an economic slowdown were clear; we saw reduced greenhouse gas (GHG) emissions and improvements in air quality, highlighting the scale of the climate crisis (Figure 3.1). COVID-19 is the first instance where economic activity has come into direct opposition with public health and through which humanity's impact on nature has begun to blow back on us in unpredictable ways (Tooze 2020). This has forced us to think of new ways to make things work and in turn, create new methods to produce, distribute, purchase and consume things (Wijayasundara 2020).

These new methods, combined with our new limitations, seem to favour a circular economy (CE) while accentuating the shortcomings of a linear system where resource extraction and waste production cause untenable environmental degradation, climate change, biodiversity loss and pollution (Ellen MacArthur Foundation 2020). Our reliance on globalization and economic growth as drivers of green investment and sustainable development is no longer realistic and, with around USD 10 trillion in economic stimulus being unveiled by governments all around the world, there is an unprecedented opportunity to move away from unmitigated growth towards a lasting balance between people, prosperity and planetary boundaries (Ibn-Mohammed et al. 2021).

The CE model is being proclaimed as an environmentally responsible way of renewing economic growth in the aftermath of COVID-19 (Panwar and Niesten 2020). It has been suggested that adopting CE principles will mitigate some of the

Figure 3.1: Global CO_2 emissions (1900 - present)



Source: Global Carbon Project (2021).

detrimental effects of the pandemic and provide a long-term solution for change.

First, adopting a CE at a national level will reduce overreliance on one country as a manufacturing hub for the world (Ibn-Mohammed et al. 2021). Second, moving away from a traditionally polluting, energy-intensive manufacturing economy towards an economy that is focused on renewable energy, smart materials and digital technology will help in the fight against pollution (ibid). A study by the Ellen MacArthur Foundation found that a CE development path could halve carbon dioxide emissions by 2030 relative to 2018 levels (Ellen MacArthur Foundation 2015).

Finally, as it is typically labour intensive, the transition to a CE will allow for local job creation to take place. Estimations by the International Labour Organization (ILO) suggest that if a 5 per cent annual increase in recycling rates replaces the direct extraction of primary resources for recycled products worldwide, employment would grow by 0.1 per cent by 2030 and the services and waste management sectors would grow by 50 and 45 million jobs, respectively (International Labour Organization, 2018).

From a broader perspective, by reducing the cost of essential services, such as mobility and food, a CE will also be beneficial for lower-income households, reducing the inequality that has increased both between and within countries since the beginning of the pandemic.

However, achieving this new model will require rethinking, resetting and redesigning the economy in a way that it becomes more prosperous, inclusive and low carbon, moving away from a traditional model that is simply reactive in times of crisis (Ellen MacArthur Foundation 2020).

This will require key enablers such as: incentive mechanisms; partnerships and collaboration; aligning the circular economy with mainstream policies; and the creation of traceable actions and targets to help unlock and accelerate circular actions (World Business Council for Sustainable Development 2020). Alongside this, there will be a need for complementary policies that enable a more inclusive and 'just' transition, ensuring reduced inequalities within and between countries as well as ensuring that no one is left behind (Ellen MacArthur Foundation 2020).

4. Moving from linear to circular production

To reduce the impact on the environment, decreasing the amount of natural resources we use will not be sufficient as this will not alter the finite resources we have but only delay their inevitable depletion. Therefore, a change in the entire structure of the system is necessary.

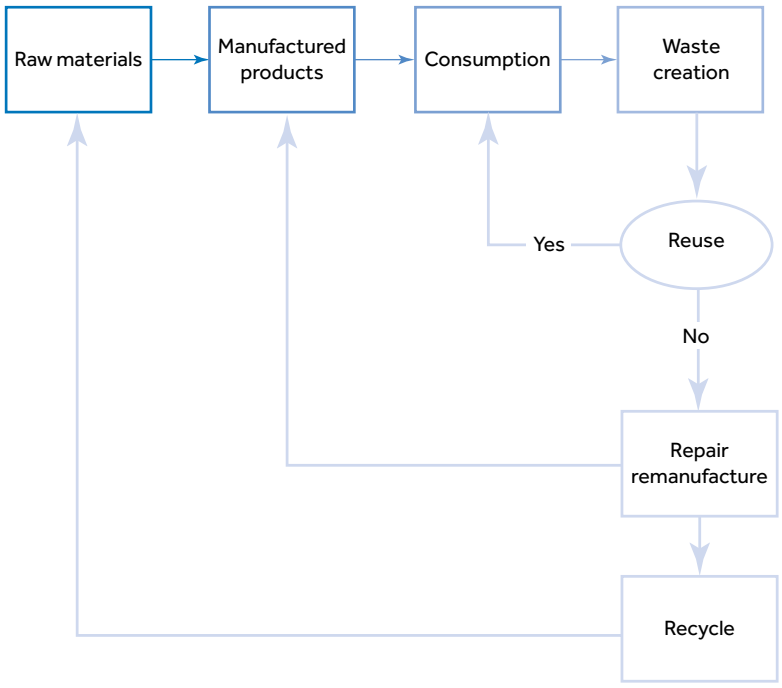
The circular economy has thus been suggested as an alternative to the traditional linear economic model. Its main aim is to replace the 'end of life' concept and 'disposal' ideas that are present within the linear model and shift towards restoration of products and the use of renewable energy, eliminating the use of toxic chemicals and focusing on removing waste through improved designs of materials, products, systems and business models (World Economic Forum 2014).

The key assumption in the move from a linear to a circular economy is a feedback loop that either returns the collected waste back into usable products or transforms it into valuable raw material through the recycle, repair and remanufacture process (Figure 4.1). Depending on different technological characteristics, a single type of waste may be recycled several times and reused in subsequent cycles of production processes (Drljača 2015).

The CE is a paradigm shift, attempting to integrate both economic activity and environmental wellbeing through replacing the dispose mentality with the 3Rs: reducing, reusing, recycling throughout production and consumption processes (Garcés-Ayerbe et al. 2019).

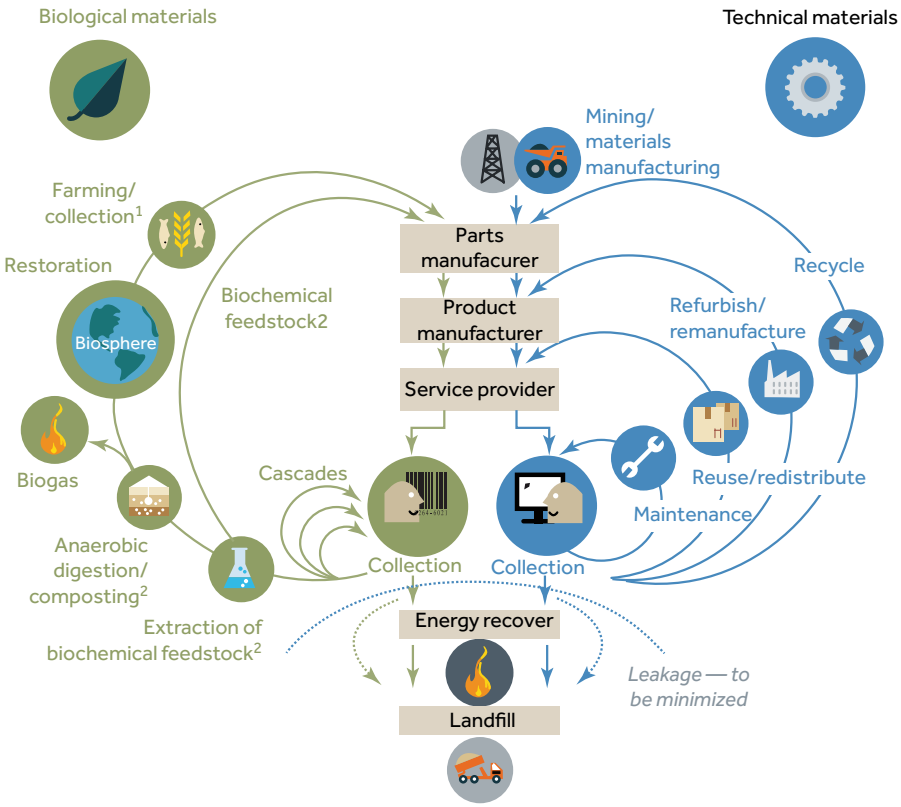
In theory, it hinges on three main principles: designing out waste - products are designed and optimised for a cycle of disassembly and reuse; keeping products and materials in use - where non-toxic products are returned to the biosphere; and regenerating the natural systems – where the energy required to fuel a product cycle should be renewable by nature (Figure 4.2) (Ellen MacArthur Foundation 2013).

Figure 4.1: Circular economy flow diagram



Source: Adapted from Upadhayay and Alqassimi (2019) and Drljača (2015).

Figure 4.2: The circular economy: Restoring damage done during resource acquisition



Source: Ellen MacArthur Foundation (2013).

In the case of technical materials, the consumer is replaced by a user and durable products are leased, rented or shared wherever possible (Ellen MacArthur Foundation 2013). If products are sold, there are incentives or agreements in place to ensure the return and reuse of the product or its components and materials at the end of its period of primary use (World Economic Forum 2014).

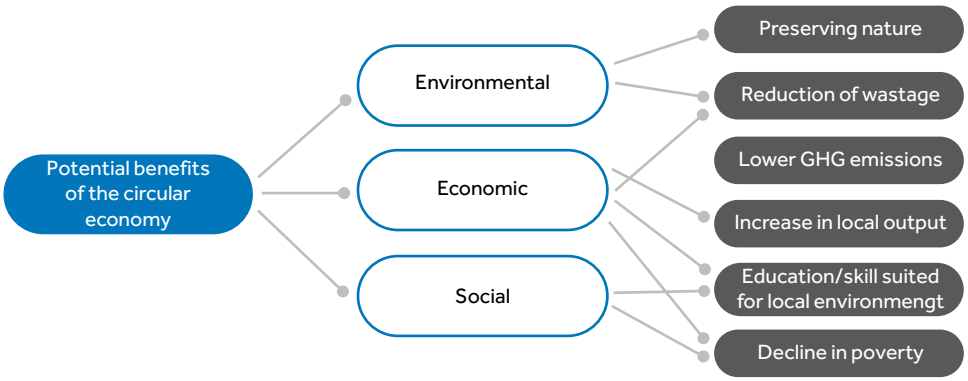
In practical terms, the CE aims to (i) emphasize environmentally conscious manufacturing and product recovery (Gungor and Gupta 1999); (ii) promote the prevention of unintended ecological degradation through partnerships between corporations, consumers and government (Bauwens et al. 2020); and (iii) shift the focus to an integrated product value chain via promotion of product repair/re-use and waste management (Ibn-Mohammed et al. 2021).

Within the context of manufacturing activities, the CE aims to prolong the use of products as well as putting products, by-products and waste materials back into the economy, making sure resources are in the economy for as long as possible (Garza-Reyes 2019). The principal goals of implementing a CE strategy in an organization are to reduce the use of virgin materials and output of waste as well as protecting the environment and preventing pollution (Garcés-Ayerbe et al. 2019). In other words, a CE strategy is implemented to achieve sustainable development through improved resource efficiency (ibid).

Despite the CE being widely discussed, only limited progress has been accomplished so far regarding its implementation. Several factors have been suggested as the main barriers in this regard. One study, focusing on a range of manufacturing firms, found that there is a shallow understanding of and insight into the CE as well as low knowledge levels, prohibiting an evolutionary change towards this model (Ritzén and Sandström 2017). In addition, there was a large risk aversion towards more disruptive changes and a preference for small incremental business steps, suggesting that the CE model would not be welcomed (ibid).

On the consumer side, research has found that there are cultural barriers such as lack of interest in and awareness of the subject as well as the

Figure 4.3: The multiple benefits from the circular economy



perception that a recycled or refurbished product produced by reclaimed material would not have the durability and performance of a completely new product (Kirchherr and Hekkert 2017). Market barriers are also cited as one of the main issues when it come to the CE, as high upfront investment costs stop businesses from moving towards this model (ibid). Finally, a lack of synergistic governmental interventions is also considered to be a barrier, as a lack of coordination means that policies to enact the CE are not achieving successful policy developments and in turn not achieving desired outcomes by governments (Nadeem et al. 2018).

However, compared to the linear economy, the multiple benefits of the circular economy cannot be overemphasized. We classify the benefits into three main categories (Figure 4.3):

i. ***Environmental:*** In contrast to the linear economy, the CE would significantly reduce wastage, thereby minimising pollution through the reduction of GHG emissions and preserving the natural environment through lower levels of resource extraction for raw materials.

ii. ***Economic:*** A key tenet of the CE is local production, which means use of local resources and the local labour force. An increase in the use of local labour would increase employment while safeguarding the rate of extraction of local resources. In addition, increasing demand for products, such as electronics, has the potential to create jobs in a CE. As demand for electronic products increases, e-waste recycling and urban mining could not only provide secondary resources but also create decent employment (Xavier et. al. 2019).

iii. ***Social:*** An increase in local production indicates an increase in local output, which in turn increases incomes and reduces poverty. In addition, strengthening local skills improves social conditions while also ensuring critical knowledge used to preserve nature is passed on.

Box 4.1: Examples of circular production in action

A report produced by the Ellen MacArthur Foundation in 2014 analysed several categories of resource-intensive products in order to understand how the circular economy could support improvements in these areas. They found that the cost of remanufacturing mobile phones could be reduced by 50 per cent per device if the different manufacturing companies made phones that were easier to disassemble, improved the reverse cycle and encouraged individuals to return phones (Ellen MacArthur Foundation 2014).

When looking along the value chain, the report found that the United Kingdom would be able to create a revenue of USD 1.5 billion annually at the municipal level by processing food waste discarded by households and the hospitality sector (ibid). It also suggested that each tonne of clothing that is

collected and sorted in the UK could generate revenues of USD 1,975 – or a gross profit of USD 1,295 – through the aggregate impact of clothes being worn again, reused by going to different industries to make insulation or upholstery stuffing or being recycled into yarn to make fabrics that save virgin fibre (ibid.).

Substantial savings and reduced environmental impacts are also possible at the company level, demonstrated by an increasing number of reference cases. The textiles industry uses vast quantities of water and chemicals and produces huge amounts of toxic waste, a major problem in countries such as Bangladesh, China, India, Thailand and Vietnam (Thornton 2019). Dutch company DyeCoo has developed a process of dyeing cloth that uses no water at all and no chemicals other than the dyes themselves (ibid). The CO_2 they do use to dye clothes is reclaimed from existing industrial processes, recycling 95 per cent of it in a closed loop system (DyeCoo 2021). Because the cloth does not need time to dry, this reduces the length of the production process, using less energy and reducing costs.

Research suggests that if food waste was a country, it would be the third highest emitter of GHG after the United States and China (Food and Agriculture Organization 2013). British start-up Winnow has developed a smart meter that analyses the amount of food being wasted in commercial kitchens. This can be installed on kitchen bins, and catering staff also tap a screen installed above the bin as they throw away food throughout the day to identify what food was thrown in and at what stage. This not only helps kitchens to reduce waste but also increases profits as chefs are more aware of what is being wasted and are able to adapt their purchases accordingly (Winnow 2021).

5. The micro-macro nexus: Policies to strengthen the circular economy

The significance of adopting a circular economy over the linear one cannot be emphasised enough. Several studies have pointed out that a business-as-usual approach would be perilous as time runs out to prevent natural resource destruction (Garcés-Ayerbe et al. 2019; Bauwens et al. 2020). Micro-level research offers options and examples of how business can adapt from linear to CE.

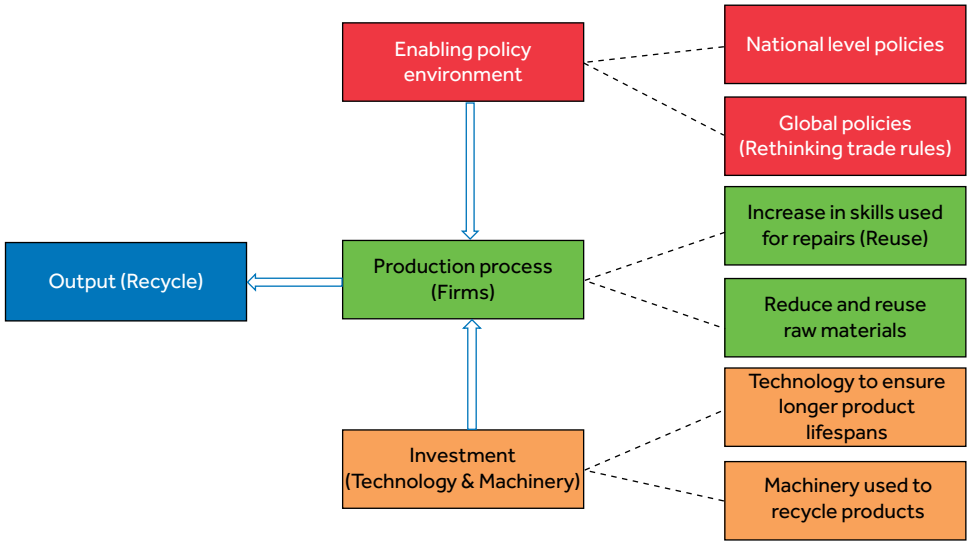
This section outlines a micro-macro nexus. It emphasises the role of the government in promoting the CE, a role that, together with the private sector, would provide synergies and act as an accelerator (Nadeem et al. 2018). For firms to adopt the CE model, policies that provide appropriate incentives at the national and global level will go a long way in strengthening the move from the linear to the circular.

Figure 5.1 proposes an analytical framework for identifying policy options aimed at creating an enabling environment to encourage businesses to adopt the CE. The framework has its basis in the CE business process, i.e., designing out waste and ensuring inputs such as raw materials are reusable and that final products can be recycled. In addition, the framework has its basis in the Solow model equation (which focuses on long-run economic growth) – especially the macro aspect – with total output in an economy determined by factor inputs: technology, capital and labour.

Nevertheless, in identifying possible policy options for adoption by countries in the effort to enhance the CE uptake by firms, we acknowledge that the structure of economies often differs from country to country.

Figure 5.1 identifies three areas for the macro analysis of the circular economy. In the first area are specific inputs that can be directly targeted by policies to create an enabling environment for the production process, successful production processes and positive investments in both technology and machinery. The second level is the grouping of the specific inputs into three areas. The third level is output, which is assumed to adhere to the circular economy tenets of reduce, reuse and recycle.

Figure 5.1: Analytical framework



The first and second areas of the analytical framework are combined in the explanations below. We identify the enabling policy environment, the production process and enablers which are classified as investments and, within each, we discuss the necessary inputs.

5.1 Enabling policy environment: National and global levels

At the macro level, the adoption of the CE requires a firm national and global commitment. At the national level, governments can set deliberate targets such as commitment to reduce waste production by set amounts and within a target period.

At the global level, countries can come together multilaterally to agree on the way forward and set targets that must be adhered to by all countries. Two recent proposals in international discourse include:

i. The recently proposed minimum corporate tax, adopted through a vote by 130 Organisation for Economic Co-operation and Development (OECD) member countries (July 2021), and strongly endorsed by the G7 and G20 in July 2021, could have positive implications for CE as it encourages firms to produce where there are markets rather than seek production in low tax regions.

ii. Concessional lending by international financial institutions, such as the recently proposed Resilience and Sustainability Trust by the International Monetary Fund (IMF), that will provide lending for climate projects to developing and vulnerable middle-income countries.

5.2 Firms: Reusable raw materials and reskilling labour

Reducing waste and reusing raw materials are at the core of the CE. At the micro level, firms are encouraged to design out waste through their business process and ensure lower levels of natural resource extraction. In addition, adoption of new business processes will require new labour skills, such as an increase in the skills required for repairs and for recycling products. At the national level, governments can work with firms by adjusting the policy environment. Suggestions include:

- ***Pricing waste:*** Governments and the private sector have been working together and are in consensus on the important role of carbon pricing as a tool for reduction of GHG emissions. A similar tool for pricing waste production would strengthen adoption of the CE. Waste pricing would aid firms in determining waste production in their operations, as well as the impact of waste produced on natural resources and the environment. For governments, waste pricing would generate an additional source of revenue.
- ***Review of curricula for skills required to adopt the CE:*** Governments, in consultation with the private sector, could align higher education curricula to take into account the skills required for the CE. Incentives such as financing research programmes that strengthen the CE could be prioritised. Curricula could also ensure that CE principles are adopted at primary levels of education.
- ***Tax incentives:*** Tax incentives include offering businesses that adopt CE models tax holidays and charging lower tax rates for firms that reduce waste and take up labour skilled in CE.

5.3 Investment: Technology, plant and equipment

While governments can provide enabling environments for firms to invest, they can also crowd in private investments through investing in CE infrastructure.

- ***Incentives for firms to invest:*** Use of fiscal and monetary policy to encourage firms to invest in the CE. Introduction of subsidies to firms that invest through lower lending rates and guarantees.
- ***Government investment in plant and equipment:*** Earmark funds from waste pricing for investments in infrastructure used for the CE.
- ***Tax incentives:*** Zero rate duty on investments used for the CE.

6. Implications for Commonwealth countries

This section applies the analytical framework from the previous section to Commonwealth Member States. It is worth noting that economies as diverse as the 56 Commonwealth countries require varying policies and adoption strategies to successfully implement the CE, and that a one-size-fits-all approach will not work. Nevertheless, the framework provides a useful first assessment that identifies countries needing differing national and global level policies to enhance uptake of the CE. Commonwealth countries also provide an excellent starting point to utilize the framework since membership spans across five continents, with 32 of the 56 countries being small states.

The analysis is divided into two strands: (i) small states; and (ii) emerging market/ developing economies and advanced economies.

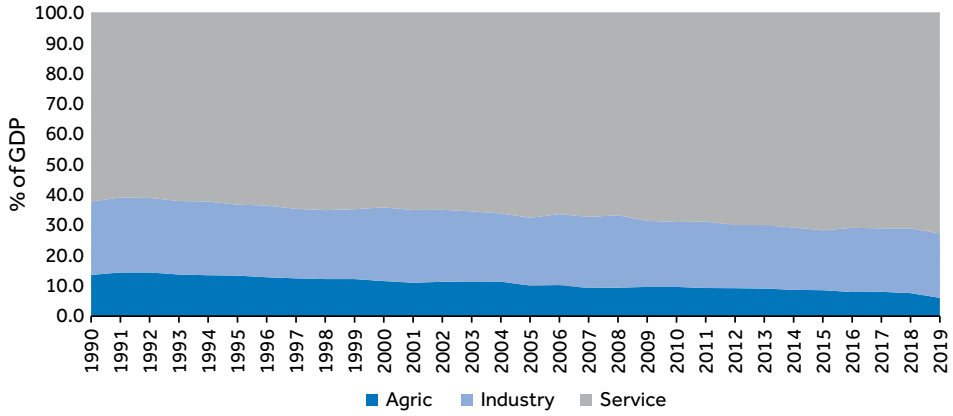
6.1 Small states

The key features of small states are small population size and a geographic position that is often remote and far removed from markets. These features can make small states vulnerable to weather-related shocks, which adversely impact economic growth. Consequently, small states are associated with high debt burdens and a vicious economic cycle, as well as high levels of openness that can make them vulnerable to external trade-related shocks, with several small states stagnating at middle-income level, unable to make the leap toward self-sufficiency.

Small states' economies are, in most cases, skewed towards services since their small population size means industry is not viable, and they are highly dependent on manufactured imports. For the 32 Commonwealth small states, services has been the main sector over the last three decades, with its share in GDP increasing by about 10 percentage points from 62 per cent of GDP in 1990 to 72 per cent in 2019. In contrast, the industrial sector declined from 24 per cent of GDP in 1990 to 21 per cent in 2020 (Figure 6.1).

The biggest income earner and employer in the services sector for small states is tourism. For example, just over 37 per cent of the Caribbean labour force was employed in this sector in 2019, while the contribution of tourism to GDP was 38.5 per cent in 2019 (World Travel & Tourism Council 2021). The sector, by its nature, has an aspect of the CE, since tourists gain access to, rather than own, accommodation and sights when visiting small states. Nonetheless, even within this sector, backward and forward linkages with manufacturing, and in particular food processing, mean that opportunities to reduce, reuse and recycle still exists.

Figure 6.1: The increasing importance of the service sector for Commonwealth small states



Source: World Bank (2022)

However, given that most products are imported – imports of goods and services averaged 62.7 per cent of GDP for the 32 Commonwealth small states in 2019 (World Bank, 2022) - the opportunities are limited mostly to recycling and the better management of waste created by imported products. Consequently, the policies that would ensure the most returns for a CE would be under the recycling pillar.

Small states' governments, as a starting point, could focus on pooling together resources and implementing policies best suited for recycling to strengthen the CE. Similarly, regional manufacturing plants that implement the reduce and reuse principles, with governments pooling resources to implement policy, would provide viable options to enhance the CE.

Dependence on imports means reliance on the adoption of the CE by trade partners. For importing countries, global treaties that require trade partners to adhere to CE principles, and enforcement through pricing, would be an alternative for small states since the adverse effects of the linear economy impact them disproportionately compared to larger economies.

Box 6.1: Vanuatu: A small state leading in the CE transition

Despite being a small state, Vanuatu has already displayed its ability to implement the circular economy within its development plans. Traditionally, economic growth is associated with a decrease in the quality of ecosystems and natural assets such as soil, fish and marine environments. However, Vanuatu has chosen to move away from this linear mentality towards more collaborative strategies along both the domestic and international value chains (UNDP 2021). This shift in strategy has allowed the country to show that its economy is 59 per cent circular, exceeding by far the global average of 8.6 per cent (ibid). Because Vanuatu is on the frontlines of climate change, it has seen first-hand the devastating effects that GHG emissions are having on small states, despite them contributing very little. This has spurred the Government to keep pushing forward and prioritise the conservation of natural assets for future generations over short-terms gains (ibid.).

One of the ways the country hopes to work towards this is by focusing on agroforestry. Shifting away from traditional practices to more commercial agriculture caused an increase in chemical fertilisers and pesticide use, which harms river ecosystems and reduces soil fertility (GGGI 2018). Alongside this, burning is a traditional method of clearing land despite having damaging consequences to health, air pollution and carbon emissions. Through green businesses, the country aims to restore and protect landscapes by, for example, making organic compost to sell to farmers and tourism-related businesses that are actively protecting land through their operations (ibid.). Through these circular activities, the country hopes to restore and even reverse some of the damage done by intense agroforestry practices.

Another area that Vanuatu focuses on is waste management practices. If the waste management system is not managed correctly in the country, especially in terms of processing the metals and minerals in imported goods and materials, there is a direct threat to its environment and subsistence tradition (UNDP 2021). Therefore, certain systems have been put in place to manage this. Government initiatives so far include a landfill tipping fee at the Bouffa landfill (equivalent to around EUR 28.5 per tonne), with annual revenues of around EUR 168,500 used to finance local solid waste management (ADB 2014). In addition to this, a successful pay-as-you-throw (PAYT) scheme, where the fees paid by households (or businesses) for waste management are linked to the actual amount of waste generated, has been implemented in Luganville, where around 96 per cent of residents participate in a scheme where they buy bags for the collection of non-compostable waste (Brink et al. 2017).

Going forward, the country plans to implement further schemes, looking at areas that will reduce GHG emissions and avoid solid waste through the CE. This includes aligning its tax regime with its development ambitions, increasing government revenues by taxing pollution and using these revenues to support the transition to a CE (UNDP 2021). In addition, the country plans to collaborate

with development partners to develop circular procurement to reduce waste, resource extraction and GHG emissions associated with investments, as well as collecting and sorting recyclable materials and exporting those that cannot be used or processed domestically (ibid.).

In order to be able to carry out this ambitious plan, the Government of Vanuatu will need funding. It will therefore be crucial for the country to strengthen its institutional capacity to manage climate adaptation initiatives and attract more international funding for this purpose (UNDP 2021). Moreover, to regulate international trade and stop harmful substances from entering the country's ecosystem, an effective customs system will need to be in place with corresponding infrastructure and technology.

6.2 Emerging markets/developing and advanced economies

In emerging markets/developing economies and advanced economies, the breadth of areas in which the CE could be implemented is wide ranging. Encouraging responsible consumption and production is the main aim throughout these different countries, which would, in theory, allow for responsible growth. The implementation of the CE in advanced economies is gaining traction because it is being facilitated by different government actors, an important part of the analytical framework.

However, for emerging markets/developing economies, challenges include a lack of coordinated support from governments and an absence of funds for the significant investments in both digital and technological infrastructure that are needed for the transition, both elements highlighted as crucial within the micro-macro nexus. For the CE to be successful, government efforts and incentivising policies will need to be implemented to facilitate the transition away from the dominant linear model. Box 6.2 gives examples of CEs in action for emerging markets and advanced economies.

Box 6.2: Case study of the CE potential

Bangladesh

After a decade of progressive economic growth, Bangladesh is now moving towards developing country status and it should achieve this by 2024 (Hossen 2021). With this in mind, the country will soon need to compromise on the prevailing duty-free, quota-free access to preferred markets, making the future of exports more difficult (ibid). Alongside this, the COVID-19 pandemic has shifted the way the world works, making it more complex and with technology and global competitiveness becoming one of the prime areas for growth and development. In this sense, the CE could be a sustainable economic model to reduce resource gaps and improve sustainability in the country (ibid.).

In Bangladesh, the garment industry is one area in which this could be implemented. It generates around USD 5 billion in products annually and employs 3 million workers, of which 90 per cent are women (Edie 2021). The industry is traditionally characterised by a one-way system: resources are converted into manufactured products that are sold for use and eventually discarded. The country is one of the biggest producers of dead stock (unsold and unsellable inventory), ranking 2nd worldwide in average dead-stock volume per country (Roshitsh 2020). This increase in garment production is intensified as consumer demand increases, causing damage to the planet's physical environment. The COVID-19 pandemic also damaged the industry as more than 200 apparel factories in Bangladesh closed shop, with job losses said have affected 357,000 garment workers, more than six times the original estimate of 56,372 (Chua 2021).

Several suggestions have been made by the Global Fashion Agenda, a Denmark-based sustainability forum, on how to respond to this issue. This includes production of new garments made from recycled waste, and the implementation of a Circular Fashion Stock Marketplace for overstock garments that

have piled up because of cancelled orders during the COVID-19 crisis (Ishty and Tasneem 2021). Mapping and tracing waste streams has also been suggested as a first step as currently the waste is mixed together and sold cheaply (Islam et al. 2021).

The importance of dialogue has also been emphasized: bringing the brand and the recycler together will help to improve the quality of garments as well provide a platform to talk about different pricing mechanisms and help recycled materials become competitive with virgin material (Islam et al. 2021). The hope is that the transition to a CE in the market for textiles has the potential to decrease carbon, water footprint and waste to landfills by 15 per cent (Ishty and Tasneem 2021).

However, a huge amount of capacity building will be needed for this to take place as well as engagement with both the central bank and policymakers to make sure that incentive mechanisms are in place for investors who wish to participate in these new schemes (Islam et al. 2021), corresponding to the national level policies of the analytical framework.

An analysis of the labour-market impacts of the CE model will also be necessary as its implementation could mean lower levels of production, translating into fewer working hours and job losses in some sectors, which could be devastating as the country mainly relies on low-wage labour, suggesting an increase in re-skilling may need to take place (Ishty and Tasneem 2021). Both digital and technological investments would also need to be put into place to achieve a CE model that could also impact the labour market (ibid.).

Canada

Canada has already advanced greatly in the CE approach, focusing on downstream recovery and recycling. This has been facilitated by an enabling policy environment as well as investment in technology and machinery, aided by its developed country status. However, a more proactive waste approach is now needed for the country to work towards its CE goals, as recycling and recovery require additional input resources to re-circulate materials into use (CCA 2021).

An innovative approach therefore involves eliminating waste entirely from product lifecycles before they reach the recycling, recovery or landfill stage, therefore capturing the value of resources in the upstream stages of the product lifecycle (CCA 2021). This could involve replacing raw virgin materials with secondary materials in the initial stages of the production process, reducing both raw material extraction and waste management costs. This could also be done by designing products for resale, reuse and repair, as well as finding new markets for unused outputs (NZWC 2021). Overall, this strategy of waste prevention would offer both financial and economic benefits for governments and businesses, alongside improving environmental, social and economic outcomes.

However, several barriers stand in the way of this implementation. These include a lack of information or knowledge among firms on how to make and redesign products as well as a lack of understanding on how to find new uses for residuals (Kellam at al. 2020). There is also a lack of uptake from consumers with regards to products that are seen as less efficient because they are produced from material that has been recycled rather than virgin material.

Both liability and regulatory challenges, such as multiple layers of jurisdiction and complex or expensive regulatory burdens, make it more difficult for firms to change processes and try new innovative ways of doing things (Kellam et al. 2020). In addition, many of the changes needed to improve circularity can increase short-term costs and reduce short-term income, improving competitiveness for firms that have not yet switched to sustainable methods (ibid). Without clear policy or demand signals, the long-term payoffs of making these changes are uncertain.

7. Conclusion

Over the last five decades, global trade and economic output have more than doubled. While the increase in globalisation and sustained economic growth achieved the desired outcome, as global poverty headcount ratios at USD 1.90 a day declined from 36.2 per cent of the global population in 1990 to 9.3 per cent in 2017, the strain placed on natural resources from production has increased, with adverse effects on the climate.

A business-as-usual approach will likely lead to climate-related shocks that have the potential to undo the gains in poverty reduction. The circular economy is a way of reducing increases in output through moving away from the traditional linear model. COVID-19 is an opportunity for the CE to be implemented as it has shown the impact that a slowdown of economic activity has on the environment, as well as instigating a focus on local manufacturing as a way to build a resilient economy and enable job creation.

The limits of the linear economy have been exposed in this paper, and many companies have noticed that this system increases their exposure to risk through high levels of commodity prices and increased volatility in resources markets. A decrease in agricultural productivity, alongside a predicted difficulty in meeting future resource needs have also been highlighted as limits to the model. The CE hopes to address these issues through moving away from the 'end of life' concept towards the restoration of products and the use of renewable energy in production.

The key assumption in the CE model is a feedback loop that either returns the collected waste back into usable products or transforms it into valuable raw material as a result of the recycle, repair and remanufacture process. This helps to design out waste, keep products and materials in use and regenerate natural systems. However, only limited progress has been accomplished so far regarding the implementation of the CE due to a lack of understanding and insight into the topic as well as a lack of consumer interest and awareness.

A micro-macro nexus has been suggested here to identify policy options aimed at creating an enabling environment to encourage businesses to adopt the CE. This framework includes both micro aspects – such as designing out waste and ensuring that inputs such as raw materials are reusable and final products can be recycled – as well as a macro aspect, with total output in an economy determined by factor inputs: technology, capital and labour.

Different levels for the macro analysis of the CE have also been identified. The first level identifies specific inputs that can be directly targeted by policies to create an enabling environment for the production process, such as national level policies and an increase in skills used for repairs. The second level groups these specific inputs into three main groups: the production process; an enabling policy environment; and investment in both technology and machinery. The third level is the output, which is assumed to adhere to the CE tenets of reduce, reuse and recycle.

To understand the potential impact and opportunities for the CE on Commonwealth Member States, further research is needed. Special attention must be paid to the effects of the CE on labour markets, especially in countries heavily reliant on low-wage labour. Furthermore, an understanding of how bringing together both private and public stakeholders can impact capacity building will be necessary to promote CE actions, share best practice and leverage national action. Finally, the impacts of new technologies will also need to be analysed not only from a labour market perspective but also from an environmental perspective.

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Appendix A: Areas of development for the circular economy

SMALL STATES

Country	Opportunities for the circular economy
Asia-Pacific	
Brunei Darussalam	plastic waste/recycling/scrap materials
Fiji Islands	plastic waste/recycling/green technology
Kiribati	household waste/circular agri-food
Maldives	marine litter/recycling/upcycling/plastic waste in tourism sector
Nauru	circular agri-food/recycling
Papua New Guinea	urban mining/sustainable tourism/municipal waste management
Samoa	waste management/recycling (plastics)/circular agri-food
Solomon Islands	recycling/circular agri-food/marine litter
Tonga	renewable energy/circular agri-food/waste disposal
Tuvalu	marine plastics/waste management/recycling
Vanuatu	Agricultural waste/recycling/plastic waste
Europe	
Cyprus	clean energy/waste and water management/green jobs
Malta	waste management/full product cycle/food waste
Africa	
Botswana	electronic waste/recycling
Eswatini	waste management/agriculture/trade
The Gambia	organic agriculture/materials recycling/product reuse/construction materials
Lesotho	building materials/agriculture/waste management/textile and garment sector
Mauritius	solid waste management/food waste/smart agriculture/fast fashion industry/ plastic waste
Namibia	e-waste/bioeconomy/plastic waste
Seychelles	plastic waste/blue economy/food waste/recycling/agriculture
The Caribbean	
Antigua and Barbuda	plastic waste/marine litter
The Bahamas	blue economy/tourism industry/agriculture
Barbados	plastic waste/tourism industry/recycling
Belize	waste management/fisheries and seafood/marine litter
Dominica	plastic waste/recycling
Grenada	agriculture/plastics/tyres
Guyana	plastics/construction sector/recycling

Jamaica	farming/tourism/construction materials/plastic waste
St Kitts and Nevis	fisheries/waste management
St Lucia	plastic waste/sustainable tourism
St Vincent and the Grenadines	energy sector/recycling
Trinidad and Tobago	plastic waste/waste management

EMERGING AND DEVELOPING ECONOMIES

Country	Opportunities for the circular economy
Bangladesh	garment manufacturing
Cameroon	waste management/wood production
Ghana	plastic waste/agriculture/housing and construction
India	cities and construction, food and agriculture, mobility and vehicle manufacturing
Kenya	packaging waste/agriculture sector
Malawi	waste management both inorganic and organic
Malaysia	plastic waste/palm tree biomass
Mozambique	municipal waste management/marine plastics
Nigeria	agriculture and food sector/waste/plastics industry
Pakistan	automobile industry/agriculture/plastic waste
Rwanda	agriculture/construction/waste/transport
Sierra Leone	plastic waste/urban farming/access to water
South Africa	waste management
Sri Lanka	plastic waste/organic waste
Uganda	electronic waste/agriculture
United Republic of Tanzania	organic waste/recycling/agricultural waste
Zambia	municipal waste/construction/recycling

ADVANCED ECONOMIES

Country	Opportunities for the circular economy
Australia	plastic waste/organic waste/construction/hazardous waste
Canada	plastic waste/waste prevention: construction, manufacturing, health care, agriculture, plastics, retail/green procurement/cities as innovation hubs
New Zealand	construction/recycling/plastic waste
United Kingdom	emissions from landfill/manufacturing/waste management/recycling/producer responsibility schemes

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