THE CIRCULAR ECONOMY AND INTERNATIONAL TRADE

Options for the World Trade Organization (WTO)

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ABSTRACT

This report explores the interface between trade and a transition to a more circular economy. In today's highly integrated economy, international trade plays a critical role in facilitating this transition, by exploiting existing comparative advantages and allowing economies of scale. Goods and services already cross borders at virtually all stages of the circular value chain, from upstream design services to remanufactured goods and secondary raw materials. Yet trade policies are not always aligned with circularity objectives. Similarly, policies aimed at fostering a circular economy can have detrimental effects on trade even if unintended. As the role of trade and trade policy attracts more attention, understanding how it can effectively support a circular economy transition becomes critical for policy makers.

As a contribution to this emerging field of research, this report reviews the main findings of existing literature and supplements it with qualitative insights from interviews with trade policy makers; researchers in non-government organisations; private sector firms operating in different segments of circular economy value chains; and international organisations focused on different aspects of the circular economy. It starts with a short description of the circular economy as a concept, before reviewing the role of international trade in facilitating a transition to a more circular economy. In doing so it explores in particular the role of multilateral institutions and trade policy frameworks, such as the World Trade Organization (WTO), and provides specific recommendations for action.

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ABBREVIATIONS

APEC	Asia-Pacific Economic Cooperation
CE	Circular Economy
CPC	Central Product Classification
CTS	Committee on Trade in Services
CTE	Committee on Trade and Environment
COP	Conference of the Parties
DMC	Domestic Material Consumption
EGA	Environmental Goods Agreement
EPR	Extended Producer Responsibility
ESM	Environmentally Sound Management
EU	European Union
GHG	Green House Gases
HS	Harmonized System
ILO	International Labour Organization
LDC	Least Developed Countries
MC	Ministerial Conference
MFN	Most Favoured Nation
OECD	Organization for Economic Cooperation and Development
PACE	Platform for Accelerating the Circular Economy
PIC	Priori Informed Consent
PSS	Product Services Systems
RoO	Rules of Origin
RTA	Regional Trade Agreements
SITRA	Finnish Innovation Fund
STC	Specific Trade Concerns
TESSD	Trade and Environmental Sustainability Structured Dialogue
TMC	Total Material Consumption
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
WEF	World Economic Forum
WTO	World Trade Organization
WCO	World Customs Organization

1. INTRODUCTION

The transition from a linear, extractive, produce-use-discard model to a more circular approach promoting resource efficiency and the decoupling of economic outputs from material inputs implies a significant change in business models. In today's highly integrated world economy, international trade is likely to play a critical role in facilitating this transition, by exploiting existing comparative advantages and allowing economies of scale. Goods and services related to the circular economy (CE) already cross borders at virtually all stages of the value chain, from upstream design services to remanufactured goods and secondary raw materials. The digitisation of the global economy increasingly enables the rapid scaling up of new business models, potentially completing a virtuous circle.

At the same time, several governments have used a variety of trade restrictive measures in their pursuit of enhanced circularity as illustrated by recent import bans on plastic waste. As the role of trade and trade policy attracts more attention, understanding how it can effectively support a circular economy transition becomes critical for policy makers. Yet, this complex interface is still an emerging field of research with limited analysis to draw upon.

The International Chamber of Commerce's Research Foundation commissioned this research to contribute to the debate. This report reviews the main findings of existing literature in this area, and supplements it with select qualitative insights from stakeholders interviewed in the course of implementing the project. The stakeholders comprised a mix of policy makers participating in the Trade and Environmental Sustainability Structured Dialogue (TESSD); researchers in non-government organisations working on trade and the circular economy; private sector firms operating in different segments of circular economy value chains; and international organisations focused on different aspects of the circular economy.

The paper starts with a short description of the circular economy as a concept. Section 3 reviews the role of international trade in facilitating a transition to a more circular economy. Section 4 focuses on trade policy tools and instruments relevant to supporting the uptake of a circular economy. Section 5 explores the role of multilateral institutions and trade policy frameworks, with particular focus on the role of the World Trade Organization (WTO) in potentially facilitating the transition. Section 6 provides specific recommendations for the TESSD in the WTO.

2. WHAT IS THE CIRCULAR ECONOMY (CE)?

Since the eighteenth century, the global economy has largely relied on a growth model based on the extraction, transformation, and disposal of natural resources and related materials, with significant environmental consequences in the form of soil and water pollution or greenhouse gas emissions (GHG). Continuous use of resource materials in industrialised countries and a rapidly growing demand in emerging economies have further exacerbated this trend, with the weight of materials consumed worldwide more than doubling in the last 40 years (McCarthy et al. 2018). Today, the Global Resources Outlook 2019 estimates that extraction and processing of natural resources is responsible for 90% of biodiversity loss. The OECD projects that by 2060, global materials use—including metallic ores, non-metallic minerals, biomass, and fossil fuels—will almost double to reach 167 Gt (OECD 2019a). In the absence of mitigating policies, GHG emissions will grow by 80% from 41 Gt CO2 equivalent in 2011 to 75 Gt CO2 equivalent and the toxic effects of key metal extraction and processing are expected to double during this time (OECD 2019a).

These challenges have prompted governments to look for solutions that enhance resource efficiency and decouple economic growth from material inputs. In this context, the transition to a more circular economy (CE) is often seen as a response to the triple challenges of climate change, biodiversity loss, and unsustainable patterns of natural resource exploitation.

Besides this environmental dimension, the circular economy is also seen as a strategy to reduce value chain exposure to resource supply risks. In recent years, over-reliance on certain critical minerals (e.g., cobalt, or rare earth) for advanced technologies such as electric vehicles or smartphones has become a matter of international concern, and the circular economy is sometimes seen as a way to protect business from resource scarcity and associated price volatility (Europe Commission 2015). Finally, some see opportunities in a circular economy transition, for re-industrialisation, GDP growth and job creation. The IISD & Sitra (2020) argue for example, that by creating a more resilient model, the circular economy has the potential to create new, decent jobs. The International Labour Organization (ILO) estimates that a 5 per cent annual increase in recycling rates and a 1 per cent annual growth of rental and repair services would result in 0.1% employment growth worldwide with the services and waste management sectors growing by 50 and 45 million jobs, respectively.

Box 1: Defining the circular economy

In the absence of a universally agreed definition, the circular economy essentially remains an umbrella concept (Blomsma 2017). The Ellen MacArthur Foundation defines it as "an economy that provides multiple value-creation mechanisms which are decoupled from the consumption of finite resources" (Ellen MacArthur Foundation & McKinsey 2015). The Finnish Innovation Fund (SITRA) talks about "an economy in which resource use is planned to be sustainable and where production and consumption create the smallest possible amount of loss and waste. Economic growth is decoupled from GHG emissions and resource consumption and enables the regeneration of natural ecosystems" (SITRA 2016). Chatham House defines it more as "a systemic approach to resource efficiency in which 'end-of-life' products and materials are recycled, repaired or reused through circular value chains with waste from one process becoming an input into other processes" (Preston et al. 2019).

In practice, most approaches focus on the notion of efficiency of finite natural resources and the need to decouple material extraction and use from economic outputs (McCarthy et al. 2018). In this context, resource efficiency implies not only adding value but also keeping the resource in use for a longer time in the economy and reducing the environmental impacts associated with extraction, transformation, and disposal (UNEP 2017). According to the UNEP International Resource Panel (IRP), resource use could decline by 28% by 2050 as a result of efficiency measures and GHG emissions could be reduced by 63%. Decoupling on the other hand, implies that the growth in the value of outputs happens while at the same time material inputs decrease or grow at a slower rate.

Bocken et al. (2016) identify three main mechanisms through which decoupling and resources efficiency can be achieved. These are usually referred to as "*closing resource loops*", "*slowing resource loops*", and "*narrowing resource flows*". Closing the loops aims at replacing primary materials with secondary ones, for example through recycling, second-hand goods, or repaired and remanufactured products (McCarthy et al. 2018). Slowing the loops refers to the extension of the product life cycle, for example by designing products in such a way that they can easily be reused or repaired. Finally, narrowing the resource flows refers to situations where more value is extracted from the resource itself (e.g., though enhanced technology, reduced waste or through sharing models like carpooling).

Looking at it from a private sector perspective, the OECD (2019b) defines five main circular business models as drivers of a circular economy transition (see Table 1). *Circular supply models* aim at substituting primary materials inputs with renewable or recovered materials. A second model focuses on *resource recovery*. It collects and sorts waste materials (e.g., metals, plastics, or paper) to be transformed into secondary materials. *Product life extension* models increase the life of products for example by improving durability, reusing products otherwise discarded (e.g., second-hand goods) or repairing, refurbishing, or remanufacturing products. *Sharing models* focus on under-utilised consumer goods and assets (e.g., housing or vehicles) for example through co-ownership or co-access mechanisms. Finally, *product service systems (PSS)* sell services rather than the product itself. Examples include online platforms to access music or movies, pest control services, and lighting services.

Table 1: The five circular business models

Circular supply models	Substitutes primary materials inputs with renewable or recovered materials
Resource recovery models	Collects and sorts waste materials to be transformed into secondary materials
Circular product life extension models	Increases the life of products by improving durability, reusing products repairing, refurbishing or remanufacturing products
Sharing models	Focuses on under-utilized consumer goods and assets (e.g. housing or vehicles) through co-ownership or co-access mechanisms
Product service system	Sells services rather than the product itself (e.g., platforms to access music or movies, pest control services, and lighting services)

Source: OECD (2019b)

While some of these models are already well-established, others have been developed more recently, thanks to technological innovations such as the digitisation of the economy and the emergence of online platforms. Efficiency rates also depend on the type of material. For example, metals such as iron and steel may have recycling rates of up to 70%, whereas non-metallic minerals or biomass and fossil fuels are more difficult to recycle. The environmental benefits of these different models are not evenly distributed either. While remanufacturing reduces pressure on resources at the upstream level, models focusing on product services concentrate on the product-use phase (OECD 2019b).

Finally, achieving circularity requires different approaches depending on specific value chains. Taking a sectoral approach, the Platform for Accelerating the Circular Economy (PACE) Secretariat recently published five reports assessing circularity in electronics, textiles, food, plastics, and capital equipment sectors (see https://pacecircular.org/). The reports suggest ways to enhance circularity in each of those five sectors and the barriers affecting implementation.

3. THE ROLE OF INTERNATIONAL TRADE UNDER A CIRCULAR ECONOMY TRANSITION

Any transition to a more circular economy needs to understand and take into account the role of trade at different stages of the value chain. According to the OECD (2020), since the 1990s the net amount of material used in OECD countries—also referred to as domestic material consumption (DMC)—has stagnated at roughly 15 kilo-tons per capita. When compared to the constant GDP growth experienced during this period, this may indicate an absolute decoupling between economic outputs and material use i.e., increasing circularity. However, most finite natural resources tend to be heavily traded. When considering total material consumption (TMC) including embedded materials in traded goods, the material footprint of OECD countries increased by almost 70% to 25 kilo-tons per capita (OECD 2020).

This highlights the importance of considering not only trade but also embedded material in traded products when measuring material consumption and decoupling. A recent United Nations Conference on Trade and Development (UNCTAD) database prototype shows, for example, that while primary plastics still account for the majority of plastics traded (56%), more than a fourth of all plastics trade takes place through intermediate and final manufactured goods, with trade in some forms of intermediate plastics such as synthetic textiles or rubber tyres accounting for 60% of total final production (Barrowclough et al 2020).

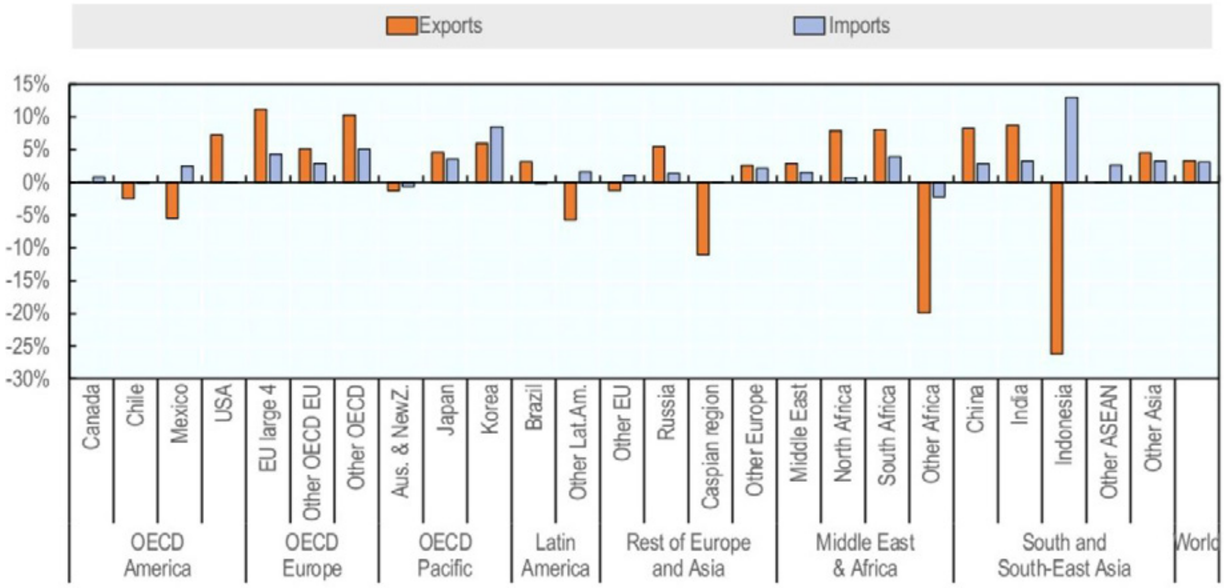
Similarly, the United Nations Environment Programme (UNEP) estimates that one-third of total materials extracted in the global economy are destined to produce goods for trade (UNEP 2020). Finally, it is worth noting that the material content of trade has increased more rapidly than aggregate growth of international trade in goods. This points towards an increased "outsourcing" of material use through trade (UNEP 2020) largely owing to Asian countries which have shifted from being the largest raw materials importers to becoming a net exporter.

3.1 Potential impacts of a circular economy transition on global trade flows

Available empirical evidence suggests that decoupling material inputs from economic outputs is not yet occurring on a large scale. Using panel data for 21 developed and developing countries from 1994 to 2008, Dussaux and Glachant (2019) show, for example, that enhanced domestic supply of secondary raw materials reduces dependence on imported secondary materials but does not seem to reduce imports of primary raw materials.

Thinking about future scenarios, it is nonetheless safe to assume that a circular economy transition will ultimately modify the composition and geography of cross border trade flows. While this may take several years, import demand for primary materials is likely to decrease, whereas demand for secondary materials, recyclable waste, second-hand products, and services will probably increase (Van der Ven 2020). Confirming this hypothesis, Dellink (2020) measures the impact on trade of a circular economy policy package consisting of a primary materials tax, a subsidy on secondary materials and recycling, and a labour tax, and projects a 35-50% decline in trade of non-ferrous metals by 2040, a 15% decline in iron and steel, and a 10% decline in non-metallic minerals. The study shows that a significant share of these declines is attributable to scale and efficiency effects, but also largely through the trade channel. Figure 1 shows the expected effects of the circular economy policy package on the trade performance of selected countries. While large differences exist between countries and regions, in general, imports will increase in most regions whereas exports will increase or decrease depending on a country's comparative advantage. This points to further specialisation among commodities exporting countries.

Figure 1: Impacts on trade in materials commodities by 2040 of a raw materials tax, subsidy to recycled material and labor tax reduction



Source: Dellink, R. (2020)

Several authors are concerned that the gradual substitution of primary raw materials by secondary raw materials may significantly affect countries dependent on export of a narrow set of materials-related commodities, particularly in the developing world (see for example, IEEP 2019, De Jong et al. 2016, Preston et al. 2019, Van der Ven 2020). These countries would have to increase their adaptability and resilience and may benefit from targeted technical assistance to build institutional and economic capacities to navigate the transition. Others point to the fact that materials will still be required to sustain the global economy and to enable a low carbon transition, a trend which may offset the decline in primary raw material associated with CE policies (Hund et al. 2020, Bibas et al. 2021, Bridle et al. 2021).

Beyond minerals, a circular economy transition may also encourage the use of substitutes for which developing countries have comparative advantages. For example, developing countries are key suppliers of non-toxic, biodegradable, or easily recyclable plastic substitutes, accounting for 92% of global jute exports and 94% of natural rubber exports (UNCTAD 2020b). Growing demand for such labour-intensive substitutes could create new trade and investment opportunities for developing countries. Similarly, by providing incentives to reuse, repair, or recycle materials, a transition to a more circular economy may encourage the development of regional recycling and reprocessing hubs for secondary raw materials (IEEP 2019). Countries with abundance of cheap labour and comparative advantages in waste management, recycling, repair, or refurbishing services (e.g., in areas such as electronic waste or phone repairs) may find opportunities to develop domestic or regional markets for reprocessing and remanufacturing and engage in higher-value circular economy supply chains (Preston et al. 2019, Van der Ven 2020).

3.2 Trade in circular economy-related goods and services

Cross border trade in circular economy-related goods and services already takes place at many different stages of the value chain from trade in services, scrape and waste or secondary materials, to second-hand goods or refurbished products. The Chatham House circular economy trade data explorer provides an interactive tool showing major trade flows of circular economy-related goods covering 900 individual commodities organised between primary and secondary material categories (https://circulareconomy.earth/trade)[1]. A major limitation to measuring trade flows in the circular economy concerns nonetheless, the Harmonized System (HS) for the classification of goods. At the most disaggregated level, HS codes harmonised internationally do not always distinguish between primary and secondary material or between used, recycled or new products. In other cases, it uses the same code for waste, residue, scrap materials and primary resources. This makes it particularly difficult to obtain reliable data and statistics on circular economy trade. Keeping these limitations in mind, the following sections review existing knowledge on international trade in specific circular economy-related goods and services.

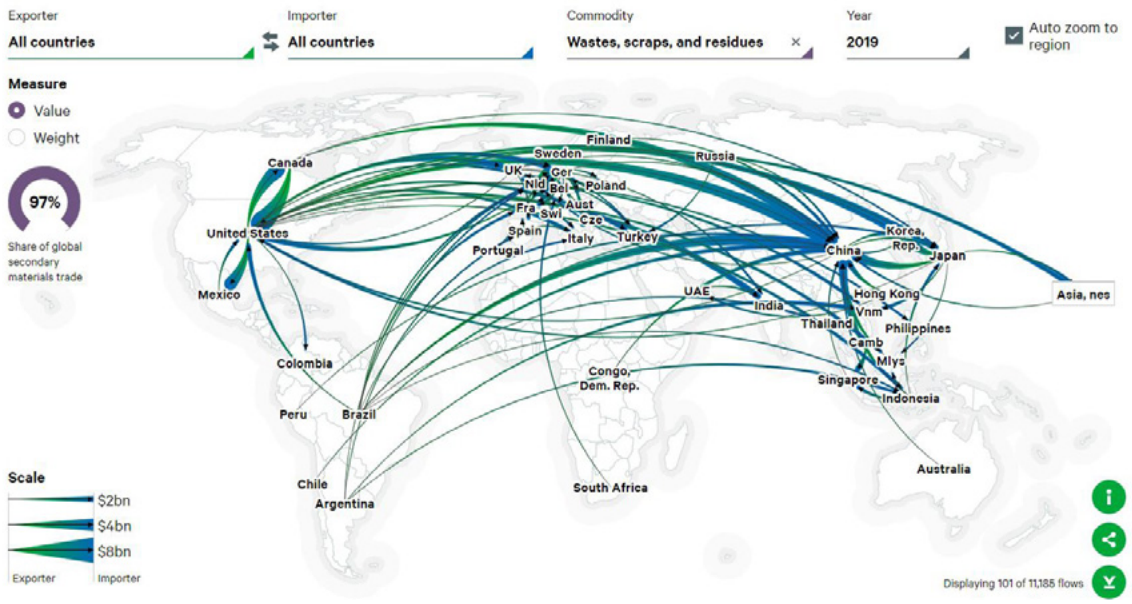
3.2.1 Trade in waste and scrap

The global trade landscape for waste and scrap is rapidly evolving, not least as a result of technological change, but also in response to measures restricting trade imposed multilaterally through the Basel convention or unilaterally. The Chatham House circular economy trade data explorer estimates total trade flows in waste scrap and residues at USD 305 bn. Figure 2 provides an overview of the size and directions of the largest trade relations. It is still clearly a northern hemisphere dominated trade and is concentrated in the United States of America (USA), the European Union (EU), and China.

The OECD provides a substantially more conservative estimate at roughly USD 95 billion in 2018 (OECD 2020). According to the OECD data, scrap metals—mostly iron and steel, aluminium, copper, and gold—accounted for 82% of total trade, while paper and plastics waste only represented 12% and 3% of the total respectively (De Sa and Korinek 2021). Metallic scrap is not only the most traded type of all waste material, it is also the one with the highest economic potential for recycling. Exports of metal scrap almost quadrupled between 2002 and 2017 to reach USD 82 billion, an amount equivalent to 27% of primary metals exports.

Given the economic potential—and increasing demand for green metals, countries may however increasingly seek to recycle domestically—for example, China in their newly announced CE roadmap plan to increase recycling of steel scrap by 23% by 2025—which will also have upstream knock-on effects on the global trade of metal ores.

Figure 2: World trade in waste, scrap and residues (USD bn 2019)



Source: Chatham House circular economy trade data explorer, https://circulareconomy.earth/trade

1 Primary materials include renewable resources, from land and sea, used for food, feed, construction, and bioenergy. Secondary materials cover both renewable and non-renewable resources including waste, scrap, and residue as well as secondary raw materials and used goods.

Besides metals, the rapid evolution of technologies in several areas may alter the global landscape of trade in coming years. For example, chemical recycling of plastics may soon generate economically viable secondary polymers. Eco-design policies are also making plastic products more homogenous in composition and economical to recycle. Similarly, waste fats and oils are now globally traded and turned into biofuels.

From an environmental perspective, trade flows in waste and scrap alone do not provide any indication of resource efficiency or decoupling. The main question is whether waste and scrap are processed and recovered in an environmentally sound manner. Where effective environmental regulations are in place, trade can support a global circular economy transition by exploiting economies of scale and comparative advantages. It allows materials to be sorted, recycled, or remanufactured in a more cost-effective manner. There are concerns however, regarding exports to destinations with insufficient waste management capacity or less stringent environmental regulations (Yamaguchi 2018). This is notably the case in South-East Asia where the increasing amount of recyclable waste exported without proper regard for these countries' capacity to recycle nor their capability to adequately inspect the quality and provenance of such waste has prompted several observers to talk about "waste dumping" (IEEP 2019). In response to these challenges, several regulations have emerged both at the national level and in multilateral fora.

At the national level, several countries imposed unilateral measures to curb trade in certain waste. In 2018, for example, China imposed a series of import bans targeting mainly plastic waste, unsorted paper waste, and certain fractions of metal waste as a way to prevent and control environmental pollution. Following China's move, in March 2019 India imposed a ban on solid plastic waste imports. Other countries including Thailand, Vietnam, and Malaysia are envisaging similar measures[2]. These moves are already reshaping global trade flows in waste and scrap. In the short term there are concerns that these measures may redirect exports to other destinations—sometimes with weaker treatment standards—or force exporters lacking domestic capacity to process these materials to increase stockpiling, incineration, and landfilling (OECD 2020).

At the multilateral level, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes serves as a forum to address environmental concerns over trade in waste. Recently, Parties adopted an amendment to improve controls on trade in hazardous, contaminated, or mixed plastic waste, which may have significant trade implications (see Box 2).

Box 2: The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes

The Basel Convention, which entered into force in 1992, aims to protect human health and the environment against the adverse effects of hazardous wastes. The Convention sets forth obligations in different aspects including control procedures, restrictions on the movements of transboundary shipments of hazardous wastes, and the promotion of Environmentally Sound Management (ESM) of hazardous wastes. 186 states and the EU are parties to the Convention. The United States signed the Convention but has not yet ratified it.

The recent focus has been on the prevention (absent express approval) of shipments of hazardous (plastic) waste from developed to Less Developed Countries (LDCs).

2 See: https://www.dw.com/en/amid-plastic-deluge-southeast-asia-refuses-western-waste/a-49467769

During the 14th meeting of the Conference of the Parties (COP14) in 2019, the Parties agreed to introduce new plastic waste-related amendments that implement stricter controls on the plastic waste trade, effective 1 January 2021:

The OECD Decision of the Council on the Control of Transboundary Movements of Wastes Destined for Recovery Operations established a procedure for the automatic incorporation of Basel amendments into the OECD appendices unless an OECD member objects. However, in 2020, OECD countries reached no consensus on the transposal of all plastic related Basel amendments. As a result, each OECD party retains its right to control non-hazardous plastic waste and other wastes in conformity with its domestic legislation and international law, with a new attempt to reach an OECD-wide agreement in 2024.

With a few exemptions, companies and economies will be facing new requirements, i.e., prior informed consent (PIC) procedure and contract and specific documentation requirements on most transboundary shipments of plastic waste. In the short term, these new requirements will make it more burdensome to move plastic products and waste internationally for recycling. In the longer term, it encourages governments to strengthen the recycling sector and innovation in circular economy amongst private and public sectors. These measures are a key example of the need for greater engagement and consultation with stakeholders to ensure that policy is focused on addressing key challenges while also identifying economic and environmental benefits.

In a circular economy, waste will become a valuable resource and plastic waste an important raw material for the production of new products. This calls for preventing secondary raw material from being defined as waste in the first place. The plastics industry is stepping up its efforts globally to build a circular economy for plastics which will help to increase recycled plastic content. Investments are being made to develop innovative technologies and build advanced recycling operations, complementing mechanical recycling. For a return on investment, it is important that these plants operate near capacity and have access to sufficient and continued supply of plastic waste including through trade.

3.2.2 Trade in secondary raw materials

Trade in secondary raw materials can support a transition to a more circular economy when the waste stream used is of appropriate quality and the exporting country has adequate recycling capacity. Tracking trade flows in this area is challenging, however, not least because the harmonized system (HS) at the six-digit level codes does not make a clear distinction between secondary raw materials and waste and scrap. Despite these limitations, the Chatham House circular economy trade data explorer estimates that global trade in secondary raw materials and used goods (including construction materials, rubber and tyres, and textiles) roughly doubled in the last 20 years to reach USD 9.6 billion in 2019. Figure 3 provides a snapshot of the direction and size of largest trade flows in 2019. It is a less concentrated pattern than that for waste and scrap metals but is still dominated by the three largest economies.

Going beyond the internationally harmonised six-digit level codes, the EU combined nomenclature at the eight-digit level provides a more granular view of trade flows in recyclable raw material. The list of recyclable materials, a subset of waste materials since not all are recyclable, used in Eurostat indicators includes five classes of products, namely: plastic; paper and cardboard; precious metal; ferrous metals (iron and steel);

and non-ferrous metals (copper, aluminium, and nickel). From these data, EU exports of recyclable raw material increased by 61% in volume between 2004 and 2019 to reach 25.5 million tons[3]. In 2016, these exports represented roughly 36% of total waste trade. Over the same period, imports decreased by 32% to 8.9 million tons, reflecting a continuous increase in the EU rate of domestic circular material use (i.e., the share of material recovered and fed back into the economy in overall material use).

Overall, strengthening markets in this area will require guarantees of quality and content of secondary raw material. The introduction of national or international material quality or content standards, as well as certification schemes, eco-design requirements, and government procurement schemes will play a critical role in achieving this objective (OECD 2020). As illustrated in Box 3, this may however require adjustments to existing regulations where standards are often based on the origin of the material as opposed to its quality.

Box 3: Standards based on product quality as opposed to origin: the case of Ragn-Sells

Ragn-Sells is a Swedish privately held corporate group created in 1881 and operating in Sweden, Norway, Denmark, and Estonia. Since 1966, Ragn-Sells has been involved in waste management, environmental services, and recycling. The group collects, treats, and recycles waste and residual products from businesses, organisations, and households. While the company has developed a range of highly climate-effective circular solutions using different waste streams as raw material, regulations regarding the use of raw materials originating from waste have prevented efficient material flows across borders and ultimately delayed the scaling up of such innovation. One specific obstacle when scaling up a circular technology from lab to commercial scale is cross border waste transports. Currently, in Europe, it may take up to six months to get approval to transport waste, and only 25 kg is allowed for lab tests whereas companies often require at least 5 tonnes of pilot validations of circular solution.

For a transition to a circular economy, using waste as a resource and raw material to recover critical resources is key. But in large parts of today's global economy, material standards are based on the origin of a resource rather than its quality. This in turn may affect the development of circular approaches. Below are specific examples of circular technologies to produce macro-nutrients such as Nitrogen (N), Phosphorus (P), or Potassium (K), which play a key role in maintaining global agricultural output.

- The Ash2Phos process can transform sewage sludge ash into raw material for phosphorus extraction and thereby be a part of a circular solution for phosphorus management. In Europe, 25% of the sewage sludge is incinerated and the ash is mainly landfilled without recovering any phosphorus. Yet, despite the ability to extract high quality phosphorus from this residue, there is currently a total ban on using it as feed phosphate within Europe because of its waste origin (see https://www.easymining.se/technologies/ash2phos/).
- EasyMining´s Nitrogen Removal Process enables efficient removal and recovery of ammonium from wastewater. The process helps to lower greenhouse gas emissions of CO2 and N2O and prevents eutrophication. It creates a circular flow with clean ammonium products made from the

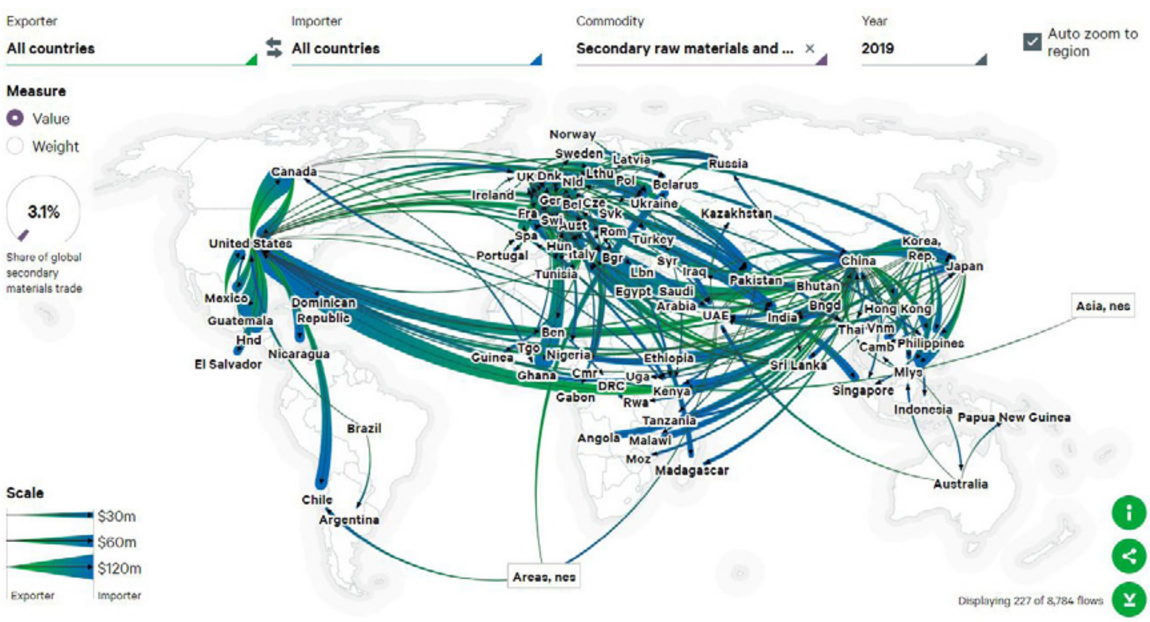
3 See https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20200331-2

nitrogen removed from the wastewater (see https://www.easymining.se/technologies/project-nitrogen/). However, as with the case of the Ash2Phos technology, when the origin is "waste" its usage and trade for production of nutrients is strictly prohibited.

> The Ash2Salt technology extracts and separates commercial salts of high quality from incinerated household waste (fly ashes) that cannot be recycled (see https://www.easymining.se/technologies/ash2salt/). The high-quality potassium chloride that is extracted is not allowed to be used in fertilizer within Europe because the origin of the material is waste. While Ragn-Sells' new factory will start producing high volumes of potassium chloride in the 2nd quarter of 2022, it will initially most probably need to export it to Canada.

When promoting a transition to a more circular economy, these examples point to the need to ensure that the quality of the product should always be the key regulatory factor in defining its use and tradability rather than its origin. This is particularly relevant for trade, not least because, in many cases, sourcing of waste needs to be done from many countries to make it economically viable compared to primary mining. Similarly, trade of materials is essential for R&D purposes. Yet, even within the domain of applied research, it remains difficult and lengthy to have resources sent across borders based on most legislations.

Figure 3: World trade in secondary raw materials and used goods (USD bn 2019)



Source: Chatham House circular economy trade data explorer, https://circulareconomy.earth/trade

3.2.3 Trade in second-hand goods, goods for refurbishment, and remanufacturing

Trade in second-hand goods, goods for refurbishment, and remanufacturing can contribute to a circular economy transition by keeping materials in use for a longer time before they reach their end-of-life stage. Here again, trade flows are difficult to track for the same reasons as secondary raw materials. While special HS codes exist for retreaded tyres, worn clothes, and second-hand construction materials, in most cases it is difficult to distinguish these goods from new products or waste in the harmonised system. As a result, trade barriers on waste and scrap or second-hand goods may affect remanufactured products as most countries do not distinguish between the two at the border (Kojima 2017).

Second-hand goods such as used cars or secondary textiles have also spurred import bans for a variety of reasons, particularly in the developing world. In 2015, for example, several East African countries applied a series of import bans and trade restrictions—mostly removed since then—on sales of second-hand clothing to protect domestic producers from cheap imports flowing in from abroad (Preston et al. 2019). Trade in second-hand goods can also create lock-in of old or inefficient technologies as illustrated by measures applied in several African and Caribbean countries to regulate or even ban the import of old or inefficient cars, as a way to comply with their commitments under the Paris Agreement in several countries from Africa or the Caribbean (Brandi 2017).

3.2.4 Trade in services

In a global economy where value from trade is increasingly linked to servicification and digitalisation, services trade plays an essential role in supporting circular solutions along the value chain from eco-design, through collecting and sorting and recycling of waste material; to remanufacturing or refurbishing (Tamminen et al. 2020). Certain business models directly rely on new types of services such as product services systems (PSS), largely enabled by artificial intelligence and technological innovation, where a service replaces the sale of goods, and product ownership remaining with the provider—as illustrated by the case of sharing platforms, pest control, or lighting services. In addition, circular economy companies often rely on traditional services commercialised with specific goods as a package, such as installation services, assembly, testing, or maintenance.

Based on a series of interviews and a survey of 41 services exports of firms involved in circular economy business models, Tamminen et al. (2020) identify a range of CE-related services that appear to be particularly traded internationally. These include IT services; professional, technical, and business services; leasing or rental services; R&D services; maintenance, repair, and installation services; sewage and waste collection services; and professional services related to construction services. An important finding of the report is that most services exporters were small or micro-sized enterprises, including young start-ups who deliver their services mostly digitally or through foreign subsidiaries. The main obstacles affecting trade in services related to the circular economy are related to differences across jurisdictions in regulations on secondary material or waste trade, or CO2 accounting-related issues. Beyond pure services barriers, restrictive measures affecting trade in CE-related goods also affect services accompanying the delivery of those goods (Tamminen et al. 2020).

4. TRADE RELATED-POLICY MEASURES TO SUPPORT TRANSITION TO A CIRCULAR ECONOMY

Given the role of trade in facilitating a circular economy transition, promoting coherence between circular economy and trade policies is becoming an imperative. This section reviews first the trade implications of circular economy policies before exploring trade policy obstacles affecting a circular economy transition.

4.1 Domestic circular economy policies with trade implications

While promoting enhanced resource efficiency and circularity requires global solutions, policy responses so far have largely been designed at the national level and in a rather uncoordinated manner. The diverging nature of these policies may in turn interact with trade in different ways. While a lot of attention has focused so far on unilateral import bans or import controls under the Basel Convention, governments have a much wider range of policy tools at their disposal including Extended Producer Responsibility (EPR) schemes, landfill or virgin material taxes, eco-design policies, circular procurement, or various eco-labelling and circular economy-related standards, to list just a few. We provide a selective discussion next.

Quantitative restrictions imposed for environmental reasons have focused mostly on hazardous waste, plastic waste, unsorted paper waste, and certain fractions of metal waste. With roughly two thirds of all plastics ever produced remaining in the environment and causing significant damage to biodiversity and ecosystems, several governments have been exploring solutions to tackle plastic pollution, recognising that in some cases this may justify trade restrictions[4]. Besides China, which in the past imported up to 70% of the world's plastic waste, UNEP estimates that 99 countries have introduced measures to curb the use of plastic bags as of 2018 (UNEP 2018). The rise of these unilateral measures and particularly import bans, has in turn generated fears that waste could be diverted to countries with less stringent regulations and/or encourage illegal trade. The Basel Convention, including its Plastic Waste Amendment adopted in 2019, addresses this concern by requesting countries to obtain "prior informed consent" (PIC) from importing countries before sending them hazardous waste. The amendment, now in force in 185 countries, also clarifies when and how the Convention applies to some non-hazardous plastic waste except those that are easily-recyclable.

From a trade perspective, while the Basel Convention provides a uniform basis to regulate trade in problematic waste, differences in interpretation and implementation at the national level can create a patchwork of regulatory requirements affecting end-of-life products, creating sometimes unnecessary costs for responsible traders (WEF 2020b). As illustrated in Box 4 with the case of e-waste, differences in regulatory requirements and the system's complexity may also deter investment in high-quality repair, refurbishment, and recycling infrastructure. To address this concern, the WEF suggests complementing efforts of the Basel Convention with **trade facilitation measures** in favour of responsible trade, for example by digitalising and automating the PIC procedure for hazardous waste to avoid delays and corruption.

Box 4: The challenges facing trade in e-waste

In recent years, the disposal of electrical and electronic equipment has generated a rapidly growing amount of e-waste fuelled by high consumption rates, short life cycles, and few repair options. This waste, estimated at 53.6 Mt globally in 2019, contains both valuable materials but also toxic substances generating air, water and soil pollution when burned for disposal or dipped in acid to recover rare metals (The Global E-waste Monitor 2020). Historically, part of this e-waste was exported mostly to the developing world with cheaper disposal facilities and lower environmental standards, imposing direct consequences on workers and communities. This reality prompted national and international regulatory intervention to control trade in hazardous waste.

According to the World Economic Forum (2020b), the recycling of e-waste relies largely on international "reverse supply chains" (i.e. the process of retrieving a used product from a customer to either dispose of it or reuse it), not least because recovery facilities are not available in all locations and require large quantities to secure economies of scale. As a result, only a handful of largescale smelters and refiners have the capacity to extract metals from e-products for resale on the international market.

4 See https://sdg.iisd.org/commentary/policy-briefs/coherent-global-trade-policy-frameworks-needed-for-circular-economy-for-plastics/

This makes the process particularly vulnerable to limitations on cross border trade. While the Basel Convention offers a common reference point, in practice the classifications of hazardous waste, non-hazardous waste, and non-waste goods destined for reuse, repair, and refurbishment may differ significantly from country to country—a situation which directly affects cross-border shipment. According to the WEF, this patchwork of regulatory requirements as well as the system's complexity deters investment in high-quality repair, refurbishment, and recycling infrastructure and favours illicit trade in sub-standard facilities or product dumping—a phenomenon affecting around 60 to 90% of e-waste worth up to USD 19 billion annually according to UNEP (2015).

Extended Producer Responsibility schemes such as take-back requirements, deposit-refund systems, or recycling requirements give producers and manufacturers the responsibility to deal with end-of-life of their products and the associated packaging. Today they mostly focus on e-waste, electronic equipment, packaging, or batteries (OECD 2020). A first concern in this area relates to the effect of EPR schemes on competitiveness. Unless the same requirements are also applied to imported products, these schemes may disadvantage domestic firms by raising their costs vis-a-vis foreign competitors who are not subject to such high standards of responsibility (IEEP 2019). On the other hand, EPR should not impose disproportionate burdens on exporters, for example by preventing organisations from collecting and processing end-of-life products on behalf of foreign producers (OECD 2020). A third aspect is the extent to which exporting end-of life products for recycling in third countries is formally recognised by the exporting country as a legitimate way to comply with recycling requirements. For example, does trade in second-hand goods undermine recycling requirements and constitute leakage from the circular flow? (OECD 2020)

Combined with EPR, **landfill or virgin materials** taxes have also been effective at reducing landfilling rates and increasing material recycling in OECD countries (OECD 2019c). From a trade perspective, they raise similar competitiveness and leakage concerns. Exports are sometimes seen as a way to circumvent them, a phenomenon confirmed by Mazzanti and Zoboli who identify landfill taxes as one possible driver of trade in waste (Mazzanti and Zoboli 2013).

Circular public procurements by national and subnational governments represent another promising avenue to promote a more circular economy (Pouikli 2021). Circularity requirements in public procurement can be imposed at the systems level, the supplier level, or the product level, encouraging different types of circular practices and solutions (European Commission 2017). When designed in a non-discriminatory manner vis-a-vis foreign competitors, public procurement can create important trade opportunities for innovative companies (Tamminen et al 2020)

Finally, **standards, labelling schemes, and conformity assessment procedures** play a critical role in a circular economy transition by defining mandatory or voluntary guidelines and procedures to enhance resource efficiency. In practice, standards can be organised under two broad categories, namely those dealing with organisational or management aspects of the circular economy, and those laying down product characteristics or their related production or disposal methods (OECD 2020). From a trade perspective, product standards are particularly relevant. These include both upstream value chain standards (e.g., eco-design, sustainable production, recyclability, or reparability) and downstream value chains for end-of-life products (e.g., quality standards for secondary raw material, refurbished or remanufactured goods (OECD 2020)).

For exporters, differences across jurisdictions in the design and implementation of standards, regulations, or conformity assessment procedures impose additional costs for exporters, particularly small and medium enterprises (SMEs), and reduce incentives to adopt consistent circular solutions along the value chain. They may even become barriers to trade if their design is exclusively based on local concerns or characteristics that may be difficult for foreign companies to comply with. For example, Tearfund shows how ambitious, transparent, and open design standards can support manufacturing and repair centres in low-income countries, whereas restrictive regulations allowing the original equipment manufacturer to exert a monopoly over repair and upgrade may create unintended barriers for such services in developing countries (Tearfund 2017). As illustrated in Box 5, with the example of IKEA, these elements point to the need for harmonisation or, at least, enhanced co-operation in the design and implementation of environmental standards and regulations (Bellmann and van der Ven 2020). According to IEEP, however, the lack of international standards on waste recycling, and circularity more broadly, significantly hinders the scaling up of circular solutions (IEEP 2019).

Box 5: Differences in standards and regulations as an obstacle to circular business models: the case of IKEA

IKEA has embarked on a transformation to become a fully circular business by 2030. This is pursued by adapting the traditional design and business models to extend the life of products, through reuse, refurbishment, remanufacturing, and ultimately recycling. The group also aims to transition away from virgin fossil materials and aim to use only renewable or recycled material by 2030. A third aspect of the strategy consist in enabling customers to acquire, care for, or pass on products in a circular way by piloting innovative approaches such as refurbishment and resell, or developing the notion of furniture as a service. Finally, a fourth commitment consists in building partnerships with relevant companies or institutions to accelerate a circular economy transition.

In practice however, pilot initiatives to develop more circular approaches have been affected, among other things, by differences across jurisdictions in standards, regulations, or conformity assessment procedures. In Europe for example, the lack of common interpretation of the Waste Shipment Regulation (WSR) currently under revision, has led to delays or barriers to “waste” movements across jurisdictions with countries adopting different lists of what is considered hazardous waste. In many cases, the definition of “waste” does not allow either to truly differentiate between products or materials which can be reused, repaired, repurposed, or refurbished versus those that should be recycled or disposed. Once a product is considered as waste, this often triggers a set of restrictions, including on ownership. Legal, fiscal, and administrative obligations also vary significantly across jurisdictions. For example, transporting used textiles to restoring facilities from one country to another sometimes requires to be registered as a waste handler or operator—a situation which adds significant delays and administrative procedures, and disincentivises investigations on new innovations and business models.

Similar challenges occur regarding Extended Producers Responsibility (EPR) schemes -e.g., for packaging or furniture. Here, the lack of harmonisation between the fees to be paid, the criteria used, or the information and reporting requirements under different schemes generate additional costs and administration for producers and risk to fragment investment in circular models. This is particularly the case when such schemes are combined with eco-modulations imposing different environmental requirements across jurisdictions. A third example relates to labelling schemes and the use of different symbols to indicate recyclability of packaging. For a company like IKEA which operates through a franchise system with over 450 stores in over 60 markets, a uniform packaging across all countries allows the movement of goods internationally to respond to national demands and avoid overproduction, which could result if goods were solely produced for one market. In practice however, having a range of different recyclability symbols on one product or packaging generate confusion for the consumers. Even more problematic, the requirements behind different labelling schemes vary from one country to the other and may even be contradictory or incompatible for example with one country penalising or banning what another country mandates. As these requirements become increasingly mandatory, efforts at harmonising them will become essential to avoid unnecessary costs and barriers to trade.

Overall, these examples illustrate the need for enhanced harmonisation or at least inter-operability among different standards, regulations, or conformity assessment procedures. This includes both efforts at establishing common and modern definitions of critical concepts like waste, reuse, repair, refurbishment, or remanufacturing, but also the need to develop international standards and use them as a basis to develop national schemes.

4.2 Trade policy obstacles affecting a circular economy transition

Besides domestic policies aimed at incentivising a circular economy transition, a number of trade policy measures or practices—usually not related to the environment—may discourage or slow down a circular economy transition. These include challenges resulting from the existing trade nomenclature product classification but also border measures affecting trade in circular economy-related goods and services, export restrictions, or subsidies, to list just a few.

One of the main challenges affecting trade in circular economy-related goods and services relates to the **classification of end-of-life products**, including waste, scrap, and secondary materials. It relates both to a lack of harmonisation among domestic practices and to limitations in the trade nomenclature which fails to distinguish goods based on their intended use or their impact on the environment. At the domestic level, product classification may differ significantly from country to country with direct consequences on trade. For example, secondary raw materials or goods for refurbishment and remanufacturing can be considered as waste in some jurisdictions and not allowed for re-shipment (OECD 2020).

Second, the nomenclature of the Harmonized System (HS) used in trade statistics and customs procedures does not always establish a distinction between secondary raw materials and waste and scrap, or between second-hand goods or goods for refurbishment and remanufacturing, and new products or waste (OECD 2020). Similarly, the HS codes make no distinction between hazardous and non-hazardous wastes, whereas such distinction is essential under the Basel Convention to control the transboundary movements of waste (UNEP and IRP 2020). Countries can use the 8- or 10-code system to differentiate between these streams domestically but in many cases that can cause further complications if different countries use different sub codes. These misalignments largely result from the fact that the HS product description is based on physical characteristics and not the intended end use of a product (van der Ven 2020) or its impact at the disposal stage. In practice, it not only makes trade monitoring difficult, but can also act as real trade barrier. Addressing this concern may require a reform of the HS system or identifying relevant 8- or 10-digit HS ex-outs or specific certification procedures.

In spite of several calls to promote liberalisation of circular economy environmental goods and services (e.g., UNEP and IRP 2020, IEEP 2019), the literature on **tariff protection** affecting circular economy-related goods is rather limited. In the absence of an internationally agreed definition of what constitutes circular economy-related goods, Steinfatt considers tariff protection applied by WTO Members on a selection of goods comprising machines for waste management, remanufacturing, and recycling; drip-irrigation systems; recycled paper; sacks and bags made of natural fibres; and inputs to bioplastics, among others. He finds that most favoured nation tariffs average 5.4% with most goods tariffs ranging from 0 to 20% and up to 50% (Steinfatt 2020)[5]. A recent study by the Swedish Board of Trade (Kommerskollegium 2020) shows that eliminating tariffs on electric vehicles could increase imports to the EU by 293 million euros every year, representing the equivalent of 12,300 vehicles (see Box 6).

Box 6: Trade barriers affecting trade in CE-related goods: the case of electric vehicles

According to the International Energy Agency (IEA 2019), transport is responsible for 24.5% of global GHG emissions. In recent years the market for electric vehicles (EV) has grown rapidly at an average of 43% since 2015 (Gersdorf et al. 2020) and offers significant prospects to reduce emissions in this area. The sector is nonetheless facing several trade barriers.

According to the Swedish Board of Trade, tariff protection on EVs and their components are often higher than those for other industrial goods and the sector suffers from tariff escalation with higher rates applied to finished vehicles than to raw materials and components. In most cases tariffs on EVs are not lower than the ones applied to vehicles powered by internal-combustion engines (ICE) and therefore do not provide incentives to import EVs over ICE vehicles (Kommerskollegium 2020). Interestingly, the 2017 version of the Harmonized System introduced a range of new subheadings under chapters 8702, 8703, or 8711 differentiating vehicles based on the type of engine and including dedicated HS codes for vehicles with only electric motor for propulsion (e.g., HS codes 870240, 870380, 871160). In future negotiations, this should allow selective tariff liberalisation based on environmental impacts. Restrictive rules of origin (RoO) in free trade agreements may also disincentivise exports of EVs. Under the EU–Mexico Agreement, for example, in order to meet the RoO requirement and benefit from the preferential tariff, EVs cannot contain materials from third countries exceeding 45% of the value of the car. Yet, EV batteries which are mostly sourced in third countries—already make up 30% to 50% of the total EV value (Kommerskollegium 2020).

Another challenge relates to the production and disposal of EV batteries. Socio-environmental impacts associated with the extraction of key minerals such as lithium or cobalt tend to generate reputational risks for producers and affect availability and sustainability of raw materials. Export restrictions or local content requirements imposed by resource rich countries create additional uncertainties (Bridle et al. 2021). This increasingly prompts producers to take a more circular economy approach to EV batteries, both to reduce their environmental footprint and their reliance on primary raw materials. This is pursued by extending the life of EV batteries through repair and remanufacturing but also through repurposing. For example, when the battery's charging capacity falls below a certain threshold, it can still be used for several years in the energy storage system to help stabilise the power grid. If the battery cannot be reused it is recycled into secondary raw material. Depending on the process, recovery rates for battery cells vary between 32% through thermal recycling to over 90% through more advanced mechanical processes such as shredding (see https://www.duesenfeld.com/).

5 As with similar attempts at defining a list of environmental goods, it should be noted however that some products may have multiple end-uses and establishing an unambiguous link to the circular economy is not always possible.

The greatest challenge affecting the closure of the resource loop relates to collection logistics for used batteries and their transportation to appropriate remanufacturing, repurposing, or recycling centres. This could be most efficiently achieved by establishing a global recycling network and common rules on battery classification where batteries could move across borders and be traded internationally to meet takeback obligations or recycled content requirements. Yet, because used batteries are usually classified as hazardous goods or hazardous waste, they are subject to specific regulations affecting international trade such as the Basel Convention. Divergences across jurisdictions in recycling regulations or definitions of what constitute waste further act as barriers preventing reuse, remanufacturing, and recycling along the battery lifecycle. Ultimately, this calls for a more harmonised system of tracking, managing, and regulating batteries, in order to ensure the most efficient type of reuse and resource recovery. Finally, the certification of recyclates combined with policies guaranteeing open trade is crucial for the implementation of a circular economy for batteries.

Besides import barriers, **export restrictions on waste and scrap** (e.g., in the form of outright bans, quotas, taxes, or non-automatic licensing) result in lower prices of metal scrap in the restricting country, and disincentives for collecting it. They also contribute to raising the prices of secondary materials on the world market, making them less competitive compared to primary materials (Steinfatt 2020). Applied for different purposes, such as promoting domestic processing or value addition, they mostly affect metals such as copper, aluminium, or iron and steel. De Sa and Korinek (2021) show, for example, that export restrictions affect as much as 40% of traded copper waste and scrap, 30% of aluminium, and 20% of iron and steel waste and scrap. To the extent that they target recyclable materials, exported to markets with appropriate recycling capacities, such restrictions ultimately slow down a circular economy transition.

Box 7: Trade barriers affecting trade in CE-related goods: the case of South African scrap metals exporter Star Recycling

Star Recycling processes scrap metals for packaging for metals foundries and mills. The company, along with similar medium—sized recyclers, receives scrap metals from many smaller 'bucket shops', who in turn receive discarded consumer metals items such as cans from hundreds of thousands of informal workers. It also has an extensive network of collection bins sited in large-scale manufacturers such as the automotive sector. These companies play a critical role in removing build-up of metals waste in the South African environment, but also in supporting livelihoods in a country blighted by poor and deteriorating socio-economic patterns.

South Africa is a persistent scrap metals surplus producing country. If the surplus cannot be exported then the environment will suffer accordingly. However, the government has long supported the metals fabrication sector, including through import duty protection, and in recent years has moved to constrain export of scrap metals to ensure adequate availability for domestic foundries and mills.

The export restriction operates through the Price Preference System (PPS). It works by requiring a permit to export, which is granted based on the number of tons applied for. Mills and foundries can then approach applicants, make an offer at a certain price, and a deal could be struck. Moreover, the PPS mandates particular discount percentages on the application price (30% for steel; 20% for aluminium; 10% for red metals—copper). Furthermore, a 20% export duty was recently imposed, ostensibly because the PPS had failed owing to its complexity. The scrap metals industry was in favour of the export restriction replacing the PPS. The two policy instruments are managed by different government departments, which disagree on the best instrument to use. Whereas the export duty was supposed to replace the PPS, both instruments are now operating in parallel. Thus, the level of uncertainty has increased hugely. Time lags have also extended. From the industry's point of view there isn't a clear ultimate decision-maker in government.

Moreover, Star Recycling argues that mills and foundries margins have tripled since the implementation of the PPS, but without notable productivity gains, nor them passing on price reductions to fabricators of metals products. Mittal Steel, for example, has apparently not retooled since the 1980s.

Star Recycling, and the Metals Recyclers Association, argue that in essence a once thriving industry supporting hundreds of thousands of livelihoods and earning valuable foreign exchange, as well as performing an indispensable environmental service, is now subsidizing an inefficient, polluting industry.

Finally, incentives provided by **subsidies** may also affect a circular economy transition starting with support provided to the production and consumption of fossil fuel energy. For example, using a price-gap methodology the IEA estimates that consumer fossil fuel subsidies amounted to USD 302 billion in 2017 (IEA 2018). When taking into account un-priced externalities arising from fossil fuel use, such as GHG emissions or social and health costs, the IMF estimates total fossil fuel subsidies amounted to USD 5.2 trillion in 2017 (IMF 2019). Besides consumer support, energy subsidies can also have significant impacts on downstream intermediate and final products that rely on fossil fuel either for energy or for raw materials such as virgin plastics. Subsidies to the metal sector can also be significant and tend to be disproportionately allocated to the primary sector, providing disincentives to use secondary raw materials (McCarthy & Börkey 2018). Since literature on this topic is scarce, considerable work is required to better understand the scale, nature, and environmental impact of subsidies for different kinds of primary materials including plastics or metals at different points in the life cycle.

5. THE ROLE OF THE WORLD TRADE ORGANIZATION

In a highly integrated world economy, ensuring that trade policy is supportive of a global shift towards a more circular economy will require concerted action at the international level, not least because no individual country can operate such a transition on its own (Tamminen et al. 2020). This can be achieved both in the context of multilateral fora such as the World Trade Organization (WTO) or in regional or bilateral free trade agreements (FTAs). Our focus in this report, however, is on the WTO. Overall, WTO disciplines do not restrict members' right to adopt sound and good-faith environmental policies as long as they do not constitute disguised restrictions on international trade or discriminate arbitrarily between countries where the same conditions prevail. In relation to the circular economy, this has been confirmed by WTO jurisprudence including in a landmark ruling by the Appellate Body in the Brazil-Re-treaded Tyres Case[6]. Beyond providing the necessary "policy

6 See WTO, dispute settlement, "DS332 Brazil – Measures Affecting Imports of Re-treaded Tyres". Available at https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds332_e.htm. Concerned with the environmental effects resulting from the accumulation of waste tyres in landfills, Brazil imposed a ban on imports of used and retreated tyres. The accumulation of waste tyres can lead to soil and ground water contamination or fire hazard. In tropical countries, waste tyres also tend to become breeding grounds for mosquitos and vectors of diseases such as malaria or zika. The ban was challenged by the European Union as a discriminatory measure, and WTO-inconsistent quantitative restrictions. The Appellate Body ruled that the ban was indeed applied in a manner that constituted an unjustifiable discrimination and a disguised restriction on trade because Mercosur countries were exempted from the ban. It nonetheless recognised that the ban was necessary to protect human health and the environment against waste accumulation and confirmed the role of trade policies, including quantitative

space" for members to apply legitimate environmental policies, the multilateral trade system can also contribute to supporting a circular economy transition by providing a space for policy dialogue, the monitoring of trade policy, trade negotiations, or technical assistance (Steinfatt 2020).

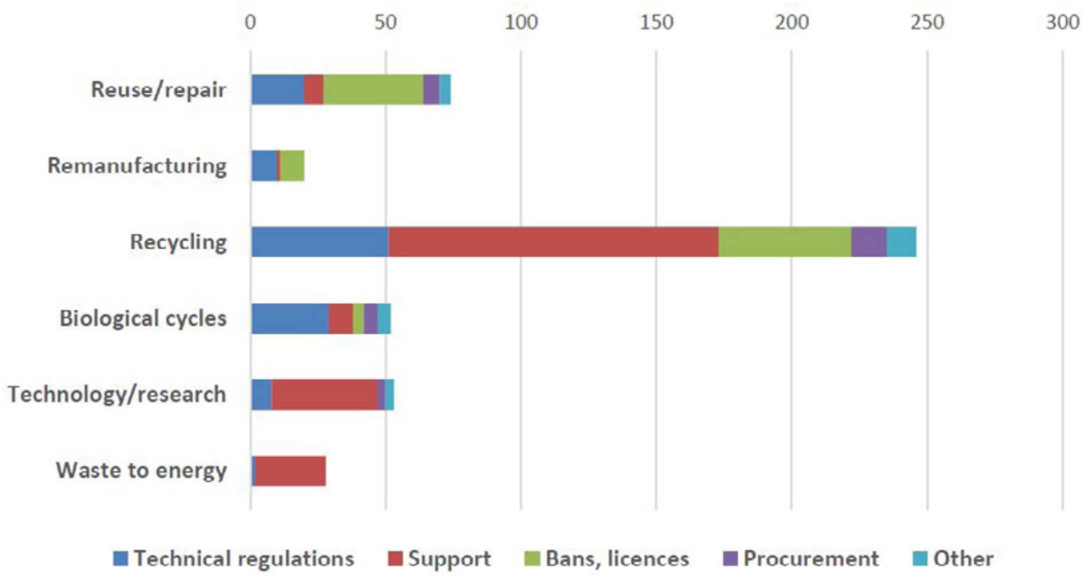
5.1 Promoting transparency and policy dialogue

The multilateral trade system provides a forum for transparency and policy dialogue by requesting members to notify environmental measures with potential trade effects and providing a multilateral space to raise specific trade concerns and share experiences in relevant WTO committees (Wijkstroem 2015)[7]. Such discussions can be extended to officials from line ministries other than trade, with responsibility for the environment. Several interviewees noted that this type of exchange, if systematically applied in the circular economy and trade debate, would help to promote alignment between obligations emerging in other organisations, and WTO disciplines.

In practice, discussions on issues related to the circular economy date back to the GATT in 1982, when Nigeria and Sri Lanka raised concerns around export of goods which were prohibited domestically by the exporting country for health or safety reasons. This led to the creation of the Working Group on the Export of Domestically Prohibited Goods and other Hazardous Substances in 1989, and the topic subsequently became part of the work programme of the Committee on Trade and Environment, itself created in 1995 (Winquist 1999).

Steinfatt's (2020) analysis of WTO notifications between 2009 and 2017[8] reveals that around 370 measures related to the circular economy have been notified to the WTO by 65 members (Figure 4). Measures identified ranged from subsidies, through technical regulations, to quantitative restrictions, and were applied mostly in the area of recycling or reuse and repair. Besides notifications, the committee on technical barriers to trade provides opportunities for members to raise specific trade concerns (STC) regarding circular economy measures with potential trade effects. This provides a space to address potential trade frictions in a pre-emptive, non-litigious, and cooperative manner by seeking clarification of the rationale for, and other aspects of, a particular measure (Wijkstroem 2015).

Figure 4: Number of measures related to the circular economy notified to the WTO (2009–17)



Source: Steinfatt (2020)

restrictions on imports of end-of-life goods to achieve those policy objectives. Following the dispute, Brazil reformed its waste tyres management policy by eliminating the Mercosur exemption in line with the Appellate Body's recommendation.

7 For example, on trade and environment or on technical barriers to trade (TBT).

8 Using data in the WTO Environmental Database, available at: https://edb.wto.org.

Overall, most STCs raised related to the circular economy focused on classification issues, concerns around standards and technical requirements, or difficulties for developing countries to comply with specific requirements (Steinfatt 2020). Finally, the trade policy review mechanism of the WTO provides an opportunity for members to ask questions about specific circular economy policies.

After several years of relatively dormant discussion, in 2020 the trade and environment debate in the WTO received renewed impetus in the form of two new initiatives. The first, launched in November by 53 Members aims to initiate a structured discussion on trade and environmental sustainability (TESSD) in the WTO[9]. It recognises, among other things, the role that international trade and trade policy play as key enablers of the transition towards a resource efficient and circular global economy. The initiative intends to complement and support the work of the CTE and other relevant WTO Committees and Bodies by promoting transparency, identifying areas for future work within the WTO, supporting technical assistance, and working on "deliverables" of environmental sustainability in the various areas of the WTO. By the 12th Ministerial Conference (MC12), Members will endeavour to bring in more participants and elaborate a work programme of discussions supported by a series of ministerial statements, potentially including trade and the circular economy.

The second initiative, led by China and bringing together Australia, Barbados, Canada, Fiji, Jamaica, and Morocco aims to promote an open-ended informal dialogue on plastics pollution and environmentally sustainable plastics trade.[10] Possible subjects to be addressed include transparency, monitoring trade trends, promoting best practices, strengthening policy coherence, assessing technical assistance needs, or identifying the scope for collective approaches including with other international processes and efforts. Members are currently contemplating the possibility to launch a transparency and international cooperation exercise and a ministerial declaration identifying next steps and instructing officials to carry on further work. As discussions progress, the trade and circular economy interface are likely to gain further momentum under both initiatives and pave the way for future actions.

5.2 The WTO as a negotiating forum

Besides transparency and policy dialogue, the system provides a forum for negotiation to remove both tariff or non-tariff barriers affecting trade in goods and services related to the circular economy. In 2001, the Doha Ministerial Declaration instructed members to negotiate the reduction or, as appropriate, elimination of tariff and non-tariff barriers **on environmental goods and services**. In light of persistent disagreement among members on the types of goods and services which should qualify as "environmental" and the approach to liberalise them, a sub-group of 46 WTO members launched in 2014 a plurilateral initiative for an Environmental Goods Agreement (EGA). The talks initially built on a 2012 decision by Asia-Pacific Economic Cooperation (APEC) economies to cut MFN tariffs voluntarily to 5% or less on 54 environmental goods. In the course of subsequent negotiations, members collectively identified around 300 goods for further liberalisation but ultimately failed to reach consensus. Since December 2016, these negotiations have not been active. However, they may be relaunched as part of the TESSD and could arguably cover a range of goods and services related to the CE.

Besides tariff barriers, non-tariff measures are likely to be the most significant obstacles to trade affecting circular economy-related goods and services. In 2004, in the context of the Doha Round negotiations on non-agricultural goods, the US already raised specific concerns over non-tariff measures affecting remanufactured goods including import prohibitions

9 See WTO document WT/CTE/W/249, 17 November 2020.
10 See WTO document WT/CTE/W/250, 15 December 2020.

on medical equipment, heavy equipment, textiles, motor vehicle parts, and others.[11] Together with Switzerland and Japan, they subsequently proposed a **ministerial decision on remanufactured goods**, calling on members to take steps to ensure that their trade regime "*evolves in a manner that enhances market access opportunities for remanufactured goods*".[12] The draft decision also proposed to review non-tariff measures including import licensing, import prohibitions, pre-shipment inspection requirements, technical regulations, and conformity assessment procedures, to ensure that they do not impose prohibitions or restrictions proscribed by WTO disciplines. Finally, the decision would have created a Working Group on Trade in Remanufactured Goods for Members to "*raise and discuss specific trade concerns regarding prospective or current measures and ways in which Members could adjust their measures to reduce or eliminate barriers to trade in remanufactured goods*". While the proposal never gathered consensus, it still illustrates possible approaches that could be envisaged under the WTO to deal with non-tariff measures.

5.3 Technical assistance and capacity building

A third area where the WTO plays a role in supporting a transition to a more circular economy is technical assistance and capacity building. This is particularly the case of the Aid for Trade initiative launched at the WTO's 6th Ministerial Conference in Hong Kong, China, in 2005, which helps developing economies overcome trade-related supply-side constraints. Such assistance could be targeted at building capacities in emerging industries such as recycling or waste management or at meeting circular economy-related standards, regulations or conformity assessment procedures increasingly imposed by developed economies (van der Ven 2020). It could also play a role to help harmonise global and regional quality standards, promote demand for second-hand goods and secondary raw materials, remove unnecessary regulatory barriers, and avoid environmentally harmful activities (Yamaguchi et al 2019). The 2020-21 Aid for Trade work programme already identifies the circular economy as an area of focus highlighting the opportunities associated with the circular economy for export diversification in developing countries (Steinfatt 2020). This move also reflects the growing attention to environmental sustainability in development cooperation.

6. RECOMMENDATIONS

Building on the analysis above, this section suggests possible approaches to be explored under the WTO structured discussion on trade and environmental sustainability (TESSD) to support a circular economy transition. These suggestions largely build on inputs from stakeholders involved in the project including participants in the TESSD initiative and private sector representatives through a series of interviews. They seek to address specific trade challenges companies are facing when applying more circular models through enhanced international cooperation in the WTO. Following the sequence of future discussions under the TESSD, the recommendations range from including specific references to the circular economy in a ministerial statement to be delivered at the 12th WTO Ministerial Conference (MC12); through initiating a post-MC12 exploratory work programme on trade and the circular economy; to suggesting pragmatic approaches for future concrete deliverables.

11 See WTO document TN/MA/W/46/Add.8/Rev.1, 18 November 2004.

12 See WTO document TN/MA/W/18/Add.16/Rev.4, 9 July 2010. For purposes of the Decision, a remanufactured good was defined as a non-agricultural good (1) that is entirely or partially comprised of parts that (i) have been obtained from the disassembly of used goods; and (ii) have been processed, cleaned, inspected, and tested to the extent necessary to ensure they have been restored to original working condition or better; and (2) for which the remanufacturer has issued a warranty.

6.1 Circular economy in the MC12 Trade and Environmental Sustainability Structured Discussions (TESSD) ministerial statement

Participants in the TESSD initiative will be issuing a statement at the 12th WTO Ministerial Conference to take stock of the discussions undertaken so far, identify priority areas for future discussions and provide a roadmap for post MC12 activities. A first step will therefore consist in putting the circular economy firmly on the TESSD agenda. Several submissions have already highlighted the importance of addressing the relationship between trade and trade policy on the one hand, and concerns around resource efficiency and the circular economy.[13] Building on existing submissions, the MC12 statement could highlight the trade and circular economy interface as a priority topic to be addressed under the TESSD initiative. At a general level, it could recognise the role of trade in fostering a circular economy transition and the importance of mutual supportiveness and coherence between the two realms of policy making. It should also stress the need for further exploratory work under a post MC12 work programme and—depending on the level of ambition—in future negotiations. In doing so, participants may want to explicitly acknowledge some of the challenges faced by developing countries in transitioning to a more circular economy and the need to address them in future discussions. While the statement shall not prejudge the result of future exploratory deliberations, it may provide general guidance regarding the type of expected results, be it in the form of enhanced transparency, the removal of unnecessary barriers to trade, or specific principles and best practices for the design of circular economy regulatory frameworks (see next sections).

6.2 A TESSD transparency and dialogue initiative

Following up on a possible ministerial statement, the next step could consist in initiating a post-MC12 exploratory work programme focused on enhancing transparency and promoting dialogue among relevant stakeholders. The relationship between trade policy and the circular economy is still a relatively new topic with limited analysis to draw upon. It may require some initial exploratory work before moving to specific deliverables and outcomes. A transparency and dialogue process may also help address a number of concerns at an early stage. As highlighted in previous sections, emerging regulatory frameworks and standards are so far largely designed at the national level and in a rather uncoordinated manner, with limited attention paid to their potential effect on trade. The diverging nature of these policies, even if not protectionist in nature may generate unnecessary barriers to trade and slow down the scaling up of new technologies.

In this context, the TESSD may promote enhanced coherence by fostering an exchange of information about existing or upcoming regulations and standards being developed by participants. This could provide an opportunity to address possible trade tensions at an early stage and could usefully complement existing discussions in the committee on technical barriers to trade. The open nature of the TESSD initiative should allow for the participation of relevant stakeholders as a way to focus the discussion on practical concerns and trade irritants faced by companies on a day-to-day basis. Besides trade delegates, the dialogue could involve non-trade ministries (e.g., environment, regulatory agencies), but also private sector representatives or relevant international institutions such as the World Customs Organization Union (WCO) or the Basel Convention.

From a substantive perspective, the initiative could focus on both trade policy obstacles affecting a circular economy transition such as classification of end-of-life products under the HS system, tariff protection, export restrictions, or trade facilitation measures; and circular economy policies with potential trade implications such as quantitative restrictions, Extended Producer Responsibility schemes (EPR), standards and labelling schemes, or circular procurements.

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13 See for example submissions by Canada (INF/TE/SSD/W/3), Switzerland (INF/TE/SSD/W/4), the UK (INF/TE/SSD/W/6) or the EU (INF/TE/SSD/W/7).

6.3 Towards concrete deliverables on trade aspects of the circular economy

A third and more ambitious set of options would consist in pursuing specific deliverables and negotiated outcomes on the trade and circular economy interface. While the TESSD initiative remains essentially a dialogue process, participants will be under pressure to show that this interaction can lead to tangible outcomes and specific deliverables. The traditional way of producing deliverables in the WTO is through negotiations. Yet, achieving progress on negotiations requires consensus among all WTO Members if the outcome is pursued multilaterally, or at least among a critical mass of economies if negotiations are conducted on a plurilateral basis. While this may not mean a majority of WTO Members, it should at least involve the top players in a particular field. This will not only imply the participation of industrialised countries which have been at the forefront of the transition to a more circular economy but may also require participation from emerging economies and other developing countries.

Several developing Members have already shown interest in engaging in a dialogue on circularity, as illustrated by earlier discussions in the 1980s and 1990s on domestically prohibited goods or more recently through the plastics initiative. However, the extent to which such dialogue should involve negotiations remains unclear. Various developing countries have rather insisted on the need to allow sufficient policy space to regulate imports of waste, as shown by the debates over retreated tyres or plastic wastes. Others are concerned about the possible impacts of a circular economy transition on their export opportunities.[14]

Promoting inclusiveness and building consensus between Members at different levels of development is usually achieved in the WTO by incorporating longer implementation periods, appropriate special and differential treatment provisions, or technical assistance to help vulnerable countries build institutional and economic capacity to navigate their economic adjustments. A different—and possibly complementary approach—may consist in exploring other types of negotiated outcomes. For example, it could be clarified at the outset that deliverables in this area may take a variety of forms and should not necessarily imply a set of binding market access commitments. The following sections explore three of these options.

6.3.1 Circular economy considerations in environmental goods and services talks

A first and more traditional option consists in including a circular economy dimension in future negotiations on environmental goods and services (EGS). Several participants have already shown interest in reviving EGS negotiations either multilaterally or—more likely—under a plurilateral format, building on the work undertaken to date in the EGA or in the committee on trade and environment (CTE-SS) and the committee on trade in services in special sessions (CTS-SS). While this option is sometimes seen as the "low hanging fruit", bringing together a critical mass of interested participants including developing countries is not an easy task and may only be possible after MC12. Should TESSD participants decide to revive such negotiations, a first step would be to include circular economy and resource efficiency as one of the environmental categories or objectives considered in the talks. Depending on how the negotiations are structured, this could be defined in terms of specific technologies (e.g., clean energy technologies, recycling technologies) or in terms of particular environmental problems (e.g., resource management, climate change).

14 At the same time, several WTO Members recognise that a circular economy transition may present new trade and development opportunities for developing countries by stimulating the use of substitutes for which they have comparative advantages (e.g., plastics substitutes) or to engage in circular economy reverse supply chains by providing services in areas such as waste management, recycling, repair, or refurbishing services.

A second step would naturally consist in identifying a set of goods and possibly services related to the circular economy. In the absence of a clear definition of what such goods and services entail, participants will have to establish their own list. Ideally, such a list should be developed in close cooperation with the private sector and particularly companies involved in international trade. Several products have already been identified in the literature (Steinfatt 2020). Others can be extracted from the 300+ goods compiled under the plurilateral Environmental Goods Agreement negotiations. As highlighted in Box 6 on electric vehicles, new subheadings in the latest version of the harmonised system may also provide additional elements. In the area of services, participants may want to look beyond the relatively narrow set of environmental services covered under division 94 of the Central Product Classification (CPC) developed by the United Nations Statistical Commission.[15] As highlighted in section 3.2.4 above it will be equally important to address a range of supporting services such as design, engineering, research and development, and digital services already identified in the literature (Tamminen et al. 2020).

As with similar endeavours, however, some products or services may have multiple end-uses and establishing an unambiguous link to the CE may be challenging. In a first instance, a pragmatic approach may therefore consist in narrowing the scope of the negotiations to a few key single use elements with a strong environmental rationale (e.g., recycling services and technologies). If agreeing on a uniform list of goods and services proves too difficult, another option might simply consist in binding unilateral trade liberalisation efforts on a list of products defined by individual Members as their contributions to the talks. This may encourage participation of a broader set of Members, not yet ready to introduce new liberalisation commitments, but interested in sending a strong signals to investors that they are already providing an open and predictable environment for certain CE-related goods and services.

6.3.2 Reviving and extending previous work on remanufactured goods

Besides tariff barriers, non-tariff measures are likely to be the most significant obstacles to trade affecting circular economy-related goods and services. As highlighted in section 5.2, several WTO Members have promoted, in the past, a specific discussion on remanufactured goods.[16] At the time, the draft ministerial decision on remanufactured goods tabled by Japan, US, and Switzerland, focused on non-tariff measures including import licensing, import prohibitions, pre-shipment inspection requirements, technical regulations, and conformity assessment procedures. It also envisaged the creation of a Working Group to “raise and discuss specific trade concerns regarding prospective or current measures and ways in which Members could adjust their measures to reduce or eliminate barriers to trade in remanufactured goods”. This provides a clear example of a pragmatic approach designed to address a specific problem. It did not focus on a particular sector but rather on a specific stage in the value chain. Evidence from the stakeholder interviewed in the preparation of this report and from existing literature point to the fact that non-tariff barriers affecting remanufactured goods remain an area of concerns. Should there be interest among TESSD participants, work in this area could be revived and arguably extended to other stages of circular value chains, for example to cover trade in refurbished and repaired goods, secondary raw materials, or second-hand goods. It could result in targeted action on non-tariff measures applied to products at the end-of-life stage.

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15 Examples of circular economy-related services outside of CPC division 94 include metal waste and scrap recovery (recycling) services (CPC 8941) or non-metal waste and scrap recovery (recycling) services (CPC 89420).

16 See the 2010 draft ministerial decision by Japan, US, and Switzerland on remanufactured goods (TN/MA/W/18/Add.16/Rev.4).

6.3.3 Defining common principles and sectoral best practices

A third option, keeping in mind the difficulties WTO Members to reach consensus in traditional negotiations, could be to privilege soft law or non-binding commitments. These may not only be easier to achieve but could also constitute a more appropriate way to address non-tariff measures of a regulatory nature. A first approach in this area may consist in defining a set of common principles for the establishment of regulations, standards, or conformity assessment procedures in areas related to the circular economy. These principles would not define specific standards but would guide individual governments when designing their circular economy policies and ensure that such policies are designed in a way that minimises unintended trade consequences, while achieving their legitimate public policy objectives. General regulatory principles already exist in the system, notably under the TBT Agreement, but the ones proposed here, would deal very specifically with the unique challenges associated with the circular economy. As illustrated in Box 3 on macro-nutrient, for example, they could include aspects such as the need to design standards and regulations based on the product quality as opposed to its origin as waste.

Besides common principles, TESSD participants could also identify a set of best practices in the design of trade-related circular economy measures such as EPR schemes, standards, or the implementation of quantitative restrictions and bans. As discussed in Box 5 with the example of IKEA, using international standards as a basis for the development of domestic schemes or promoting the use of inter-operable systems and definitions could be part of those good practices. In the area of e-waste, the World Economic Forum (WEF) already proposed the negotiation of a WTO reference paper outlining best practice commitments in support of market access obligations and efforts at promoting regulatory cooperation (WEF 2020b).

Here again, the idea is to achieve a non-binding commitment to follow a pre-defined set of good regulatory practices in the design of domestic norms and standards. Such best practices would logically have to be sector specific (e.g., for single use plastics, hazardous waste, e-waste, chemicals, etc.) and should be developed in cooperation with the private sector and relevant international organisations such as the Basel Convention. It could go a long way in avoiding unnecessary barriers to trade in a pre-emptive manner and would represent a significant outcome for the TESSD initiative. To conclude, it should be remembered that this approach is not completely new to the system. WTO precedents for the establishment of best practices exists in the TBT Committee where members have been discussing a non-exhaustive list of voluntary mechanisms and related principles of Good Regulatory Practice (GRP) to guide Members in the efficient and effective implementation of the TBT Agreement across the regulatory lifecycle (Wijkstroem 2015).[17] Given its open and multistakeholder nature, the TESSD initiative could be the ideal place to discuss such principles and good practices with interested participants.

17 See WTO document, G/TBT/32, para. 4.

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- **Stina Wallstrom**, Director Regulatory Affairs, IKEA
- **Shunta Yamaguchi**, Policy Analyst, Environment and Economy Integration Division, OECD
- **Xiaohui Zhang**, First Secretary, Permanent Mission of China to the WTO

ANNEXURE 2: Interviewees

- **Pär Larshans**, Director of Sustainability at Ragn-Sells
- **Ute John**, Head of Trade and Sustainability at Daimler AG and Katrin Bauer, Project Coordinator Strategic Projects at Mercedes-Benz AG
- **Roberta Dessi**, Public Affairs Leader at Inter IKEA Group
- **Lisa Schroeter**, Global Director of Trade and Investment Policy at Dow
- **Quintin Starkey**, CEO, Star Recycling Company

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