Staff Working Paper ERSD-2020-10 **23 June 2020**

World Trade Organization

Economic Research and Statistics Division

TRADE POLICIES FOR A CIRCULAR ECONOMY:

WHAT CAN WE LEARN FROM WTO EXPERIENCE?

Karsten Steinfatt*
World Trade Organization

Manuscript date: 12 June 2020

*Trade and Environment Division, World Trade Organization. The author is grateful to Jane Korinek, Erik Wijkström, Daniel Ramos and Hoe Lim for valuable comments and suggestions on earlier drafts of the paper and to Daniel Ramos and Fabrizio Meliado for substantive inputs. Jenny Yi-Chen Lee provided outstanding background research.

TRADE POLICIES FOR A CIRCULAR ECONOMY: WHAT CAN WE LEARN FROM WTO EXPERIENCE?

KARSTEN STEINFATT*

Manuscript date: 12 June 2020

ABSTRACT

From its initial focus on minimizing waste generation, the circular economy has evolved into a broad-based approach to make resource use more sustainable. A big part of the appeal of a circular economy is the opportunities it creates not only for resource savings and better human health and environmental outcomes, but also for trade and economic diversification. As interest in circular economy approaches grows, it becomes increasingly important to ensure that trade policies are designed and implemented with the goals of a circular economy in mind. Doing so would bolster the role of trade in scaling up circular economy solutions worldwide.

This paper reviews work at the WTO related to the circular economy. It shows how WTO members have addressed issues related to the circular economy through policy dialogue, peer review, negotiations and more recently, Aid for Trade. Experience in these four areas provides valuable insights into how WTO members can expand the positive contribution of trade to a circular economy, not least by: (i) improving their collective understanding of how trade interacts with the circular economy; (ii) building trust and confidence to engage in mutually beneficial activities related to circular economy; (iii) opening and facilitating trade in key areas of the circular economy; and (iv) supporting efforts in developing countries to seize the potential environmental, economic and social benefits of a circular economy through enhanced trade.

Keywords: International trade, circular economy, resource efficiency, sustainable development, waste, WTO, transparency, policy coordination, Aid for Trade.

JEL classification numbers: F13, F18, F42, F64, Q56

Disclaimer: This is a working paper, and hence it represents research in progress. This paper represents the opinions of individual staff members or visiting scholars and is the product of professional research. It is not meant to represent the position or opinions of the WTO or its Members, nor the official position of any staff members. Any errors are the fault of the author.

*Trade and Environment Division, World Trade Organization. The author is grateful to Jane Korinek, Erik Wijkström, Daniel Ramos and Hoe Lim for valuable comments and suggestions on earlier drafts of the paper and to Daniel Ramos and Fabrizio Meliado for substantive inputs. Jenny Yi-Chen Lee provided outstanding background research.

TABLE OF CONTENTS

1 INTRODUCTION 3

2 THE ROLE OF TRADE AND TRADE POLICIES IN CREATING A MORE CIRCULAR ECONOMY 4

2.1 A closer look at the relevant trade policies 4

2.2 Fit-for-purpose and coherent trade policies can support the expansion of the circular economy 7

2.3 Towards an efficient and safe global circular economy 8

3 WTO EXPERIENCE RELEVANT TO THE CIRCULAR ECONOMY 10

3.1 Policy dialogue: improving the collective understanding of how trade interacts with the circular economy 10

3.2 Peer review: building trust and confidence among trading partners to ensure mutually beneficial circular trade 11

3.2.1 Distinguishing between goods used in circular economy activities and unwanted waste 12

3.2.2 Using fit-for purpose and coherent standards and technical requirements 12

3.2.3 Considering the impacts on small and medium sized enterprises, especially those in developing countries 13

3.3 Negotiations: opening and facilitating trade to scale up circular economy solutions 13

3.3.1 Remanufactured goods 13

3.3.2 Environmental goods and services 14

3.4 Aid for Trade: strengthening the capacity and infrastructure in developing countries to participate and benefit from a circular economy 15

4 CONCLUSIONS 17

5 REFERENCES 18

6 ANNEX 20

TRADE POLICIES FOR A CIRCULAR ECONOMY: WHAT CAN WE LEARN FROM WTO WORK?

1 INTRODUCTION

Economic growth, underpinned by open, transparent and rules-based trade, has brought prosperity, higher living standards and poverty alleviation to many parts of the world. Much of this growth, however, has relied on linear "take-make-discard" approaches where virgin resources are extracted, traded and processed into goods, which are then used and discarded as waste or emissions. Partly as a result, the amount of resources, including biomass, fossil fuels, metals, non-metallic minerals and water extracted globally has tripled during the past 50 years (International Resource Panel, 2019).

Growing extraction, use and disposal of resources has led to air, land and water pollution, higher greenhouse gas emissions and surging waste volumes, all of which pose serious risks to human health and the environment. Looking ahead, the demand for resources is projected to increase sharply over the coming decades, spurred largely by growing populations with higher incomes (OECD, 2019a). This could amplify and accelerate the health and environmental risks from using resources unsustainably, unless countries shift away from linear approaches towards more sustainable production and consumption alternatives.

The circular economy is one such alternative. From its initial focus on minimizing waste generation, the circular economy has evolved into a broad-based approach to make resource use more sustainable throughout the product lifecycle (Ellen MacArthur Foundation, 2020). Its core goals are to: replace virgin material inputs with bio-based, renewable or recovered inputs; reduce resource use throughout the product lifecycle; and minimize waste.

To achieve these goals, circular economy approaches seek to promote a broad range of activities and functions geared at: designing and producing goods to make them less polluting and more durable; recovering goods (or their components) after their first use for second-hand use, repair, refurbishment, remanufacturing or recycling; and sharing and leasing existing assets (OECD, 2019b).[1]

Interest in circular economy approaches has grown considerably among governments, companies and consumers around the world (Box 1). A big part of the appeal of a circular economy is the opportunities it creates not only for resource savings and better human health and environmental outcomes, but also for trade and economic diversification (McCarthy et al., 2018a). As such, circular economy initiatives are becoming part of the efforts to implement the 2030 Agenda for Sustainable Development and fulfil the Sustainable Development Goals (SDGs) (Schröder et al., 2018).

Still, circular economy solutions remain niche, as linear "take-make-discard" approaches continue to dominate modern-day economic activity. For example, it has been estimated that the global economy is only 9% circular (WBCSD online). Part of the reason is that it is generally more cost-effective to produce goods from virgin resources and then to use and discard them, than to keep goods, components and materials in use at their highest utility at any time.

[1] Product-service system models are business models that combine a physical good with a service component. Examples include car sharing schemes, office equipment leases and garment rental services.

Box 1. Circular economy initiatives around the world

A growing number of governments are pursuing a circular economy and other resource efficiency initiatives of varying scope. For example, in 2016 the Netherlands introduced a Circular Economy Programme which sets a target of reducing the use of primary raw materials (minerals, fossil fuels and metals) by half by 2030 (Government of the Netherlands, 2016). Numeric targets related to circularity are also contained in China's latest Five-Year Plan (2016-2020), which calls for improving resource productivity by 15% and reusing 73% of industrial solid waste (Li, 2016). In Japan, the Cabinet approved the 4th Fundamental Plan for Establishing a Sound Material-Cycle Society in 2018 (Japanese Ministry of the Environment, 2018). The Plan defines measures and targets on resource productivity, "cyclical" resource and waste use and landfilled waste. In the United States, the Sustainable Materials Management Program Strategic Plan includes a target for reducing food waste by half by 2030 (US EPA, 2015). Finland's Circular Economy Roadmap, first announced in 2016 and updated in 2019, identifies 4 strategic goals and 29 specific actions, from using public procurement to stimulate circular approaches to establishing circularity criteria for the construction sector (SITRA, 2019). In 2019, Rwanda revised its Environment and Climate Change Policy, which calls for the establishment of a legal and institutional framework on circular economy (FONERWA online).

Several circular economy initiatives reach beyond national borders. For example, the European Union has announced that it had completed (or was implementing) all 54 actions under its First Circular Economy Action Plan, including those related to eco-design, product environmental footprints, a revised waste legislative framework and single-use plastic items and fishing gear to combat marine litter (European Commission online). In 2020, the European Commission adopted a new Circular Economy Action Plan as part of the European Green Deal, an agenda for sustainable growth. The African Circular Economy Alliance, which was launched in 2017, seeks to accelerate the uptake of practices that promote a circular economy across Africa by promoting exchanges on best practices related to legal and institutional frameworks, public-private partnerships and financing of circular economy projects. Nigeria, Rwanda, South Africa and UN Environment serve as the initiative's co-chairs. The Democratic Republic of Congo, Malawi, Niger and Senegal joined the Alliance in 2018 (PACE online).

At the global level, G20 leaders gathered in Osaka, Japan in June 2019 recognized the positive contribution of resource efficiency policies and approaches such as circular economy to fulfilling the SDGs, tackling environmental challenges, enhancing competitiveness and economic growth, managing resources sustainable and creating jobs. The UN Environment Assembly, at its fourth session held in March 2019, adopted a Resolution on Innovative Pathways to Achieve Sustainable Consumption and Production. The Resolution encourages UN member states to consider approaches and policies for improving resource efficiency and moving towards a circular economy when developing relevant national plans and policies, sustainable development strategies and sector policies. The Resolution also highlights the important role of the business and financial sectors in supporting these efforts.

Shifting to a more circular economy requires larger, more efficient and safer markets both upstream — to encourage circular innovation, design and production — and downstream — to encourage the recovery and recirculation of products and components after their first use (Yamaguchi, 2018). Fit-for purpose and coherent trade policies can strengthen the incentives to scale up upstream and downstream circular economy solutions. This makes trade policies an important component of a broader strategy to facilitate the creation and expansion of markets for a circular economy.

2 THE ROLE OF TRADE AND TRADE POLICIES IN CREATING A MORE CIRCULAR ECONOMY

2.1 A closer look at the relevant trade policies

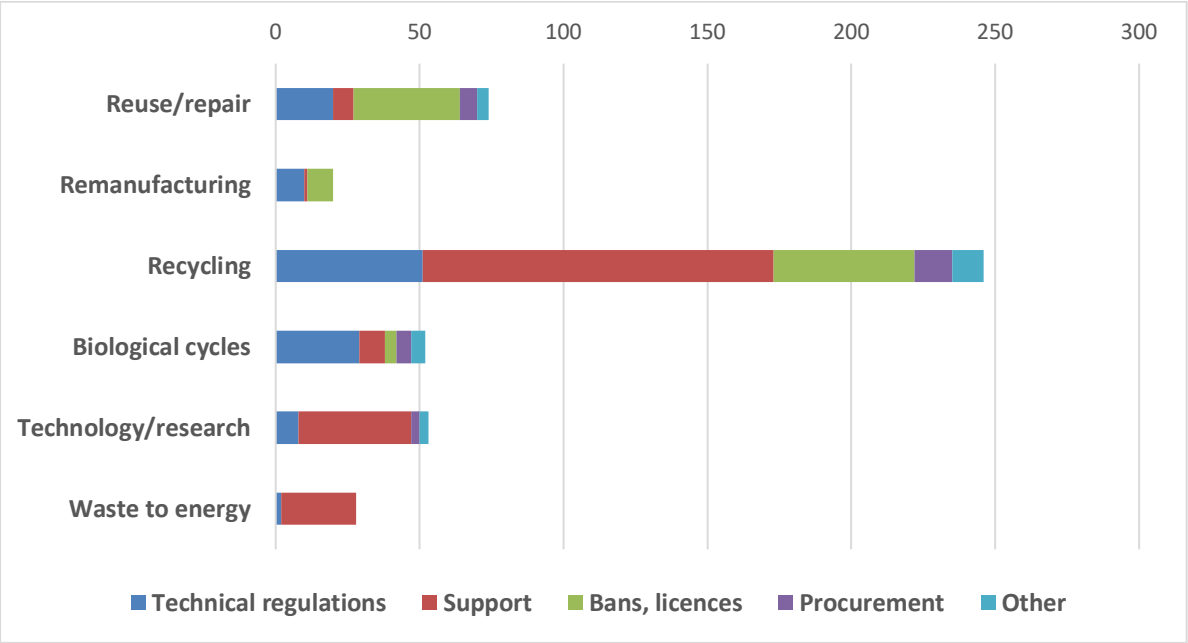
Governments around the world are already implementing a broad range of trade and trade-related policies and measures relevant to the circular economy. For example, an analysis of WTO notifications between 2009 and 2017 identified some 370 measures which refer to activities related to the circular economy.[2] The measures in question were notified by 65 WTO members.

[2] The source of these data is the WTO Environmental Database, available at: edb.wto.org. The database contains all environment-related notifications submitted by WTO members along with the environmental

The analysis shows that measures related to recycling represent around half of all relevant measures (Figure 1). Measures related to reuse and repair represent 16%, followed by measures related to biodegradability and waste-related technologies and innovation, each with 11%. Around 6% of measures relate to waste-to-energy, and 4% to refurbishment and remanufacturing. Most notified measures focus on downstream segments of the circular economy, with only a handful pertaining to design and other upstream segments. Among upstream measures, several are comprised of standards for biodegradable packaging.

Figure 1. Measures related to the circular economy

(Number of measures notified to the WTO, 2009-17)



Source: WTO Environmental Database, available at: edb.wto.org.

Government support is the most frequently notified type of measure in relation to the circular economy at the WTO. Government support comprises measures such as grants and direct payments, preferential loans and loan guarantees, and income and price support. Technical regulations, standards and conformity assessment procedures are the second most frequently notified type of measure (with 25% of all measures), followed closely by trade bans and licensing requirements (21% of all measures). WTO members have also notified government procurement measures related to the circular economy, along with a handful of sanitary and phytosanitary measures and measures pertaining to trade in services.

Reflecting the dominant role of government support, technical regulations and licensing requirements in notifications related to circular economy activities, most relevant notifications have been submitted under the Agreement on Subsidies and Countervailing Measures (39% of all measures), the Agreement on Technical Barriers to Trade (29%) and the Agreement on Import Licensing Procedures (14%). Most remaining measures have been notified under the Decision on Notification Procedures for Quantitative Restrictions[3], the Agreement on the Application of Sanitary and Phytosanitary Measures and the Agreement on Government Procurement.

Regarding the geographical distribution of notified measures, all world regions are represented. Collectively, WTO members in Asia lead in the number of relevant notifications, followed by WTOmembers in North America and Europe. In terms of development level, WTO developing

measures and policies mentioned in the Trade Policy Reviews of WTO members (See Lim et al., 2020). The analysis is based on notifications containing one or more of the following keywords (and close variations): eco-design, reuse, repair, refurbishment, remanufacturing, recycling, biodegradable, compostable and waste-to-energy. The analysis does not distinguish between measures that are aligned with the goals of the circular economy and measures that are not.

[3] See WTO document G/L/59/Rev.1, 3 July 2012.

members represent about 55% of all notified measures related to circular economy activities, developed members represent close to 41% and least-developed members constitute slightly more than 4%.

Apart from WTO notifications, the WTO Trade Policy Review Mechanism is an additional source of information on the trade and trade-related policies measures relevant to the circular economy used by WTO members.[4] Due to their broad scope, trade policy reviews are particularly well suited to obtain information on the extent to which individual WTO members have adopted trade and trade-related policies and measures affecting resource efficiency at both the upstream and downstream levels (see Box 2 and Table A.1).

[4] The TPRM is used by WTO members to examine each other's trade and trade-related policies and practices, compare experiences and learn lessons from their peers. All WTO members are subject to periodic review under the TPRM. From 2019, the four WTO members with the largest shares of world trade (currently the European Union, the United States, Japan and China) are reviewed every three years, followed by the 16 members with the next largest shares of world trade, which are reviewed every five years. The reviews of all other members take place every seven years. Trade policy reviews are based on a policy statement by the WTO member under review, a report prepared by the WTO secretariat and written questions submitted by WTO members. The secretariat report consists of detailed chapters examining the trade and trade-related policies and practices of the member under review, along with its trade institutions and macroeconomic situation. These documents are published after the review meeting, along with the concluding remarks by the chair of the review meeting and the answers provided by the WTO member under review to the questions received from other members.

Box 2. Examples of trade policies and measures relevant to the circular economy discussed in WTO Trade Policy Reviews

The TPRM has served as a platform to review several trade policies and practices related to the circular economy. For example, the 2019 trade policy review of Ecuador addressed Ecuador's tax on drinks in non-reusable, recyclable bottles of polyethylene terephthalate (PET), adopted in 2011. According to information provided by Ecuador during the review, imported and domestic bottled drinks are subject to the tax, which can be claimed back if the used PET bottles are returned. Ecuador further indicated that since the introduction of the tax, the number of recycled bottles in Ecuador had averaged around 1.6 billion units, or two bottles per week for each person living in the country. Ecuador highlighted that the 70% recycling rate for PET bottles produced and imported into Ecuador achieved in 2017 reflected the tax's success. Ecuador also noted that the introduction of the tax had resulted in higher incomes for people involved in the collection of used bottles for recycling, which were among the poorest segments of the population.

The 2017 trade policy review of the European Union also addressed a measure related to the circular economy. The review noted that some member states of the European Union lagged in terms of thorough and well-functioning inspection systems targeting illegal waste shipments in ports or on the sites of waste producers and collectors. This situation seemed to have resulted in exporters of illegal waste seeking out the member states with the most lenient controls to export their waste in a practice known as "port hopping". In response, the European Union called attention to its Waste Shipment Regulation. Following extensive amendments scheduled to come fully into force in 2017, the European Union said that the Regulation had the potential to improve inspection and enforcement on the ground as long as individual member States were willing and able to provide the necessary budgetary and staff resources to implement the Regulation's new provisions effectively.

A subsequent evaluation of the Waste Shipment Regulation carried out by the European Commission noted that the Regulation had been generally effective in delivering its objectives to protect the environment and human health from the adverse effects of waste shipments. Nonetheless, the evaluation also found that different ways of applying and enforcing the Regulation, often combined with different interpretations of its provisions and different inspection regimes, had hampered its optimal implementation throughout the European Union. The evaluation further noted that these factors discouraged legal shipments of good quality waste materials to adequate recycling facilities. Regarding the export of wastes, especially non-hazardous wastes, outside of the European Union, the evaluation noted that an important shortcoming was the insufficient control of the conditions under which these wastes were managed in the destination countries, especially in developing countries. The evaluation also stated that illegal shipments of waste within and outside the EU remained a considerable problem.

Source: WTO documents WT/TPR/M/383/Add.1, WT/WT/TPR/S/357/Rev.1 and European Commission (2020).

2.2 Fit-for-purpose and coherent trade policies can support the expansion of the circular economy

As countries continue to put in place trade policies and measures relevant to the circular economy, it becomes increasingly important to ensure that those policies and measures reinforce circular economy approaches. This has not always been the case, as past trade policies have often been designed with a linear "take-make-discard", instead of a circular model in mind. They have paid little, if any, attention to the optimum management of resources throughout their life cycle. As a result, many trade policies and measures inadvertently hinder and reduce the competitiveness of the activities and functions that are at the core of a circular economy.

Trade restrictions affecting metal recycling are a case in point. Trade in metallic waste and scrap is higher by far than any other type of waste material, representing about 80% of the value and over half the volume of trade in waste and scrap. It has been estimated that 40% of traded copper waste and scrap (and 30% of aluminium and 20% of iron and steel waste and scrap) are subject to export restrictions (Korinek, 2019). These restrictions are used for different reasons, from promoting domestic processing and value added to controlling illegal export activity. From a circular economy perspective, however, they tend to lower the prices of metal scrap in the restricting country, creating a disincentive for collecting it. Export restrictions on metal scrap also result in depressed trade flows

and higher prices for secondary metals, making them less competitive relative to (substitute) primary metals.

Government support measures for metal production may also affect the competitiveness of metal scrap processing and recycling, thereby reducing the share of secondary production in global metal supply. This could be the case of measures that seek to reduce the cost of energy and capital, as the support provided by such measures may flow disproportionately to primary metal producers, who use these inputs relatively more intensively than secondary metal producers (McCarthy et al., 2018b).

Reducing these trade and other barriers would promote the expansion of the global supply chains needed to create a more efficient circular economy in metals. There seems to be considerable potential for doing so, as recycled metals represent around 20% of global metal output for the most widely used industrial metals such as steel, aluminium and copper, and significantly less for other metals such as lithium (McCarthy et al., 2018b). Reinforcing the circular economy in metals would result in sizeable environmental benefits, as recycling metals can lead to significant energy savings compared with primary production. In the case of steel, copper and aluminium, those savings are in the range of 60 to 97% (UNEP, 2013).

More generally, opening and facilitating trade in goods, components, materials and services related to key circular economy activities (such as reuse, repair, refurbishment, remanufacturing and recycling) would help to ensure that these activities happen in the best possible locations in terms of cost, quality, skills and other location-specific advantages.

Moreover, open trade would give companies involved in circular economy activities improved access to a larger supply of recovered goods, components and materials for recirculation. Along with access to a larger consumer base, this would allow companies to decrease costs through vital economies of scale while strengthening the incentive to invest in eco-design and innovation, reverse logistics and other building blocks of circular business models. What is more, open trade could facilitate access at the lowest cost to critically important technological solutions for a circular economy, from waste sorting machines and devices that break down hard-to-recycle materials to the critical inputs needed to produce biodegradable plastics (see section 3.3.2).

2.3 Towards an efficient and safe global circular economy

Trade action to enable a circular economy must go hand-in-hand with broader action to reduce the threats to human health or the environment associated with linear economic approaches. Such threats exist, for example, when goods are exported after their first use to countries without the proper capacity to treat or recirculate them in an environmentally sound manner. Cross-border movements of hazardous or other waste under the pretence of goods for reuse or recycling pose an additional risk.

Efforts to address these and related concerns have been part of the global environmental policy agenda for several decades. They led to the adoption of the 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, along with discussions in the context of the WTO's predecessor — GATT, the General Agreement on Tariffs and Trade — on exports of domestically prohibited goods (Box 3).

Box 3. Domestically prohibited goods and the global trading system

The issue of "exports of domestically prohibited goods" was first raised in the context of the global trading system by Nigeria and Sri Lanka in 1982. At the time, Nigeria and Sri Lanka were concerned that, in several countries, companies exported goods which were either banned or severely restricted domestically for health and safety reasons. It was argued that developing countries were often unable to decide whether to allow imports of those goods because they did not know if or why the goods in question were banned or restricted in the exporting country.

The 1982 GATT ministerial meeting decided to examine this issue. Countries agreed to notify the GATT of any goods produced and exported by them but banned for sale in their domestic market. Between 1983 and 1990, a total of 50 notifications were received. Work in this area also led to the creation, in 1989, of a Working Group on the Export of Domestically Prohibited Goods and other Hazardous Substances. With the creation of the WTO in 1995, the issue of domestically prohibited goods became part of the work programme of the newly created Committee on Trade and Environment.

Source: GATT document PC/SCTE/W/7, 22 December 1994 and WTO document WT/CTE/W/43, 22 April 1997.

Some concerns also exist regarding trade in second-hand or refurbished goods. For example, it has been argued that imports of these types of goods may put additional pressure on the waste management systems of developing countries, especially when the goods in question have shorter lifespans than the corresponding goods in "new" condition (Box 4). In addition, some WTO members have noted that second-hand, refurbished or remanufactured good imports may lock economies into outdated and less efficient technological solutions and delay the achievement of environmental goals.[5]

Box 4. The Brazil – Tyres case: ensuring coherence between recycling and trade policies

The accumulation of waste tyres in landfills is a matter of important health and environment concern, not least in tropical countries. Waste tyres can become breeding grounds for mosquitoes and vectors of dangerous mosquito-borne diseases such as malaria, dengue, chikungunya or zika. Waste tyre accumulation can also lead to fire hazards and to soil and ground water contamination.

There are several waste management and recycling alternatives for used tyres, including incineration and energy valorisation, recycling of tyre components and stocking and repurposing of used tyres in gardening or urban planning. The feasibility of these options varies substantially due to economies of scale, access to appropriate technologies and financial resources. Used tyres can also be refurbished by changing their outer parts in a process called retreading. These tyres can then be resold in the market. In many countries, an important retreading industry has been developed, transforming used tyres into a relatively valuable secondary material. However, used passenger car tyres can only be retreaded once and their lifespan is half that of a new tyre. In that sense, from a health and environmental perspective, retreaded tyres can pose additional challenges to policymakers.

In order to reduce the number of waste tyres accumulated in landfills, Brazil adopted a ban on the importation of used tyres. This was later extended to also cover imported retreaded tyres. Following an arbitral decision under the dispute settlement mechanism of Mercosur — the regional trade grouping then comprised of Brazil, Argentina, Uruguay and Paraguay — imports of retreaded tyres from Mercosur countries were accepted again. Additionally, some Brazilian retreading companies received injunctions from Brazilian lower courts allowing them to import used tyres necessary for their businesses.

At the WTO, the ban was considered contrary to Brazil's trade obligations. According to the WTO Appellate Body, the inconsistency was not the ban itself or Brazil's objective to use trade policy as a tool in its wider tyre waste management policy. The main problem was that the discrimination introduced by the measure in conjunction with the exceptions (that is, that certain countries and companies were able to import used or retreaded tyres into Brazil, but not others) could not be justified by, and had no rational connection to the health and environmental objective Brazil was seeking to achieve with the trade restriction. By allowing the importation of

[5] See, for example, communication from the African Group (2010), Questions related to different NTBs proposals , WTO document JOB/MA/36.

additional used and retreaded tyres into Brazil these exceptions actually worked against that objective.

In its decision, the WTO Appellate Body recognized the importance of the protection of health and the environment against waste accumulation. It also recognized the complexity and costs involved in recycling and waste management policies, which require time and significant resources to be implemented. The special conditions of developing countries in implementing such policies were also considered. Finally, it recognized that trade policies, including bans and restrictions on the importation of goods closer to their end-of-life can play an important role in such policies. However, the Appellate Body indicated that any discrimination introduced in such polices had to be justifiable by the waste management objective itself and could not arbitrarily operate against it.

Following the dispute, Brazil reformed its regional waste tyre management policy, eliminating the Mercosur exemption. Internally, the injunctions provided by individual lower courts were revoked by a unifying decision of the Brazilian Supreme Federal Tribunal — its highest court, which ensured that the ban would be uniformly applied to all Brazilian businesses. Brazil notified the WTO of these developments, considering that it had thus implemented the decision by the Appellate Body. In that sense, it could be argued that the application of WTO disciplines in this case led to a more coherent waste management policy, even though a more complete ban on trade was instated.

Source: WTO online information, "DS332: Brazil — Measures Affecting Imports of Retreaded Tyres", available at: https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds332_e.htm.

To manage some of these risks, both exporters and importers of used and other goods flowing in and out of circular economy processes must step up coordination and cooperation. Past and ongoing WTO work provides valuable insights into how WTO members could do this to help achieve an efficient and safe global circular economy.

3 WTO EXPERIENCE RELEVANT TO THE CIRCULAR ECONOMY

The preamble to the WTO's founding charter — the Marrakesh Agreement establishing the WTO — identified trade as an instrument to help countries achieve vital policy goals, not least the sustainable use of the world's resources and the protection of the environment. The WTO offers several tools which can help WTO members put this vision into practice. This section provides an overview of how WTO members have used several of these tools with respect to the circular economy.

3.1 Policy dialogue: improving the collective understanding of how trade interacts with the circular economy

Policy dialogue among WTO members is at the core of the WTO's functions. Such dialogue comprises a wide range of trade-related issues, not least the many interactions between trade and environmental sustainability. Policy dialogue on trade and environmental sustainability helps trade officials to keep up with the latest developments on environmental policies, improve their understanding of how trade interacts with the natural environment, learn from national experiences in managing the interaction, and identify possible improvements to the global trading system that expand the contribution of trade to environmental sustainability.

The focal point for policy dialogue on trade and environmental sustainability at the WTO is the Committee on Trade and Environment (CTE). More specifically, the CTE serves as the standing forum dedicated to dialogue between governments on the impact of trade policies on the environment, and of environment policies on trade. In its recent work, CTE participants have shown growing interest in exploring the trade aspects of a circular economy.

Part of the CTE work on circular economy has taken place in the context of the briefings and updates delivered regularly to the CTE by the secretariat of the Basel, Rotterdam and Stockholm Conventions (BRS Conventions). The CTE work programme calls on WTO members to intensify dialogue and cooperation between Multilateral Environmental Agreements (MEAs) such as the BRS Conventions and the WTO to promote coherence between the global trade and environment regimes.

In November 2019, the BRS Conventions secretariat briefed CTE participants on the results of the 2019 Basel Conference of the Parties, including the decision to amend the Basel Convention to

include plastic waste in a legally-binding framework.[6] The decision seeks to make global trade in plastic waste more transparent and better regulated, while ensuring that plastic waste management is safer for human health and the environment.

WTO members have also used the CTE as a forum to discuss trade issues arising in the context of their own efforts to move towards a circular economy. For example, CTE participants have received briefings on the trade aspects of several domestic initiatives on waste and chemicals management, extended producer responsibility and recycling. Discussions have also addressed the economic and job opportunities related to the sustainable management of e-waste and the support available to developing countries to help reap those opportunities, not least by facilitating their participation in sustainable e-waste recycling value chains.[7] Some members have also proposed in the CTE to give more attention to facilitating trade in reverse supply chains and to the role that the WTO could play in helping combat plastic pollution.

3.2 Peer review: building trust and confidence among trading partners to ensure mutually beneficial circular trade

Since its first meeting in 1995, WTO members have used the Committee on Technical Barriers to Trade (TBT Committee) to discuss trade issues arising from specific measures (for example, technical regulations, standards or conformity assessment procedures) maintained by other members. This practice, known as "specific trade concerns" or STCs, is a form of peer review which allows WTO members to identify and iron out potential difficulties associated with specific measures of their trading partners.

Raising an STC is primarily an exercise in transparency which helps members to articulate concerns about specific measures in a constructive, non-litigious and cooperative manner. STCs allow WTO members to seek clarification of the rationale and other aspects of their trading partners' measures and to flag potential problems. When raising STCs, members often seek to find pragmatic solutions to those problems through technical exchanges among trade, standards and regulatory experts. The overall purpose of STCs, therefore, is to promote and facilitate cooperation to allow trade to flow as smoothly as possible so that it can play a full role in supporting WTO members' wider policy goals.

Cooperation in the context of STCs can set off a virtuous circle of improved mutual understanding, trust and confidence among trading partners in each other's regulatory systems (OECD and WTO, 2019). Mutual understanding, trust and confidence can in turn promote regulatory convergence, harmonization, mutual recognition and equivalence, all of which can help to avoid unnecessary regulatory differences and reduce unnecessary obstacles to trade.

From the perspective of the circular economy, trust and confidence among trading partners in each other's regulatory systems are paramount. Trust and confidence are a necessary condition to overcome some of the concerns raised in relation to the safety of trade in a global circular economy (see section 2). Moreover, they are also needed to reduce unnecessary trade obstacles which prevent WTO members from fully using trade as part of their broader strategies to shift to a circular economy.

Over the years, WTO members have discussed several measures related to the circular economy under the rubric of STCs (Table A.2). Three main sources of potential trade problems can be gleaned from these discussions: (i) the inability of trade regimes to distinguish between unwanted waste or obsolete goods on the one hand, and goods, components and materials flowing in and out of circular economy processes, on the other; (ii) the use of ineffective or inappropriate standards and technical requirements that do not coherently contribute to achieving circular economy goals; and (iii) the lack of proper consideration given to the constraints faced by small and medium-sized enterprises, especially those in developing countries, to meet circular economy requirements.

[6] WTO document WT/CTE/M/68, 17 March 2020.

[7] See for example, WTO documents WT/CTE/M/68, 17 March 2020, WT/CTE/M66, 22 March 2019 and WT/CTE/M/62, 20 March 2017.

3.2.1 Distinguishing between goods used in circular economy activities and unwanted waste

The ability of trade regimes to distinguish between unwanted waste or obsolete goods on the one hand, and goods, components and materials flowing in and out of circular economy activities, on the other, has been discussed in the context of some STCs. The overarching theme in these discussions has been the role of open and integrated global supply chains – underpinned by stable, transparent and predictable rules and enforcement practices – to ensure that trade-related circular economy activities result in benefits for importing and exporting countries alike.

For example, one specific measure discussed at the WTO beginning in 2012 prohibited imports of medical equipment reconditioned overseas.[8] Among the measure's goals was to avoid medical equipment producers from exporting used medical equipment to evade their responsibility to treat or dispose of it appropriately.

Several WTO members argued that such a ban was premised on the notion that reconditioned goods were akin to waste. They reasoned that countries' trade regimes should instead be capable of distinguishing between waste on the one hand, and refurbished products which had been reprocessed in accordance with best practices on the other. They further noted that the requirement for reconditioning to take place locally was impractical given the lack of good quality used equipment in many domestic markets. Instead of banning imports of medical equipment reconditioned abroad, it was suggested to require reconditioned medical equipment to be in line with best practices and to have a sufficiently long useful life.

Beginning in 2018, WTO members also discussed a measure banning imports of several categories of solid wastes for recycling.[9] Some WTO members argued that bans on imported waste with an overly broad scope could effectively prevent imports of valuable materials which had been separated from the waste stream for recycling as raw materials and were commonly traded in a distinct global marketplace. As a result, overly broad import bans could lead to large amounts of valuable materials going to landfill or incineration instead of recycling, especially if the country of origin lacked appropriate recycling facilities.

The other side of the debate underscored the obligation of each WTO member to dispose of domestic waste in accordance with the principles of "waste generator responsibility" and "proximity". These principles stress the need to treat or dispose of wastes in reasonable closeness to their point of generation. In line with this, an import ban could be considered a tool to improve domestic solid waste management.

3.2.2 Using fit-for purpose and coherent standards and technical requirements

Several STC discussions related to the circular economy have revolved around the issue of standards and technical requirements. One example is an STC raised in 2014 on the design of recycling symbols affixed to products subject to extended producer responsibility.[10] Some WTO members raised the possibility that the proliferation of partially overlapping recycling symbols would lead to confusion among consumers, fragment markets and result in disproportionately high implementation costs, not least for small and medium sized enterprises. To avoid some of these impacts, several WTO members recalled the availability of recycling symbols developed and recognized internationally.

Beginning in 2018, WTO members also discussed a specific standard for the allowable levels of "carried waste" in recyclable products. A focus of the discussion was the extent to which the thresholds for impurities in recyclable products established by the standard were in line with commonly applied specifications, including those applied by relevant industry associations.[11] They further questioned whether it was technically feasible to meet the threshold established in the recyclability standard, even when using the best available technologies. Cutting across these issues were concerns about possible differences in the recyclability standards applied on foreign and domestic materials.

[8] WTO document G/TBT/M/58, 6 February 2013.
[9] WTO document G/TBT/M/74, 22 May 2018.
[10] WTO document G/TBT/M/62, 20 May 2014.
[11] WTO document G/TBT/M/74, 22 May 2018.

In 2019, WTO members noted that a measure on disposable plastic (in this case, a requirement that certain types of disposable plastics be "oxo-degradable") was outdated and did not reflect the latest results of scientific studies on the environmental benefits of different types of degradable plastics.[12] In 2001, WTO members raised similar concerns regarding the lack of a scientific basis for a ban on certain substances in electric and electronic equipment deemed to be hazardous.[13]

3.2.3 Considering the impacts on small and medium sized enterprises, especially those in developing countries

A third issue discussed in the context of STCs related to the circular economy has been the impact of the broad array of material content and other circular economy requirements on foreign manufacturers, especially small and medium sized enterprises from developing countries.

For example, during discussions in 2001, some WTO members argued that a regulation to promote resource efficiency did not provide sufficient time for small and medium sized enterprises to adapt to wide-ranging recyclable content requirements for a broad range of (mostly electric and electronic) goods.[14] In an STC raised in 2011, some WTO members raised concerns over the challenges faced by small and medium sized enterprises to comply with extended producer responsibility schemes (in this case for electric and electronic waste).[15]

3.3 Negotiations: opening and facilitating trade to scale up circular economy solutions

Negotiating new rules allows WTO members to ensure that the global trading system can adapt to a changing world and contribute fully to sustainable development. Issues related to a circular economy have featured in several WTO negotiating initiatives. These initiatives illustrate concrete steps that WTO members can take collectively to open and facilitate trade in key areas of the circular economy.

3.3.1 Remanufactured goods

At the WTO Ministerial Conference held in Doha, Qatar in 2001, WTO ministers agreed to launch negotiations to continue liberalizing trade in non-agricultural goods. During these negotiations, one WTO member raised the issue of non-tariff barriers affecting trade in remanufactured goods such as medical and heavy equipment and motor vehicles and parts.[16] It was noted that many of the trade barriers in question were in place because countries mistakenly associated remanufactured goods with used goods and waste.

Subsequent work revealed specific measures that some WTO members considered to unduly affect trade in remanufactured goods. Among those measures were: requirements to provide a "refurbished certificate" signed by the consulate in the country of origin guaranteeing that the imported product is "like new"; prohibitions on imports of remanufactured goods if the equivalent goods are manufactured domestically or if they can be substituted for goods manufactured domestically; requirements that imported remanufactured goods meet a "special needs" test; and certification requirements from a chartered engineer that spare parts have at least 80% of their original life remaining. This work led to further discussions on ways to open and facilitate trade in remanufacturing activities.

In this vein, several WTO members proposed a "Ministerial Decision on Trade in Remanufactured Goods".[17] The proposed Decision defined remanufactured goods as non-agricultural goods that: (i) are entirely or partially comprised of parts that have been obtained from the disassembly of used goods and have been processed, cleaned, inspected, and tested to the extent necessary to ensure they have been restored to original working condition or better; and (ii) for which the remanufacturer has issued a warranty. Based on this definition, the proposed Decision called on WTO members to ensure that their trade regime would improve market access opportunities for remanufactured goods

[12] WTO document G/TBT/M/77, 15 May 2019.
[13] WTO documents G/TBT/M/74, 22 May 2018 and G/TBT/M/24, 14 August 2001.
[14] WTO document G/TBT/M/23, 8 May 2001.
[15] WTO document G/TBT/M/54, 20 September 2011.
[16] WTO document TN/MA/W/46/Add.8/Rev.1, 18 November 2004.
[17] WTO document TN/MA/W/18/Add.16/Rev.4, 9 July 2010.

and to review their trade regime to ensure that they were not imposing prohibitions or restrictions on remanufactured good imports that were proscribed by WTO.

The proposal also envisaged the creation of a WTO working group on trade in remanufactured goods, which would serve as a forum to raise concerns related to remanufactured goods trade and to discuss other relevant issues. WTO members did not adopt the draft ministerial decision. Among the concerns raised by some WTO members were the possible adverse effects of imports of remanufactured goods on domestic producers of new goods and on the transfer of newer technologies into developing countries.

3.3.2 Environmental goods and services

Countries pursuing circular economy approaches require access to technological solutions, not least the broad range of goods and services needed to improve resource and energy efficiency, replace traditional inputs with renewable or recovered goods and manage solid and hazardous waste. Given that many technological solutions for the circular economy are available in the global market in the form of goods and services, companies, governments and consumers will often rely on trade to obtain them.

In addition to providing access to those goods and services, an integrated global market helps drive down costs of production, making technological solutions that support the circular economy more affordable. Nonetheless, many trade barriers persist, which increase the costs of goods and services for a circular economy and impair their cross-border dissemination (Box 5).

Box 5. Tariffs on goods embodying circular economy solutions

Studies have confirmed the positive contribution of trade to the dissemination and adoption of sustainable development solutions. For example, a study on technologies that reduce air pollution found that countries with access to "off-the-shelf" technologies via trade can regulate and therefore tackle air pollution much earlier in their development process than countries at the technology frontier (Lovely and Popp, 2011). Part of the reason is that countries at the technology frontier had to put time and money into developing the relevant technologies from scratch, as they did not have the luxury of choosing from a range of air pollution technologies readily available in the world market. Another study concluded that the top 18 developing countries ranked by greenhouse gas emissions would be able to import 63% more energy-efficient lighting, 23% more wind power equipment and 14% more solar power equipment if they abolished tariffs and other barriers affecting imports of these goods (World Bank, 2007). These and other results highlight the importance of tackling tariffs and other barriers to trade in those goods and services needed to promote sustainable solutions.

"MFN" tariff rates applied by WTO members on selected goods related to a resource-efficient and circular economy average 5.4% (MFN or most-favoured-nation tariffs are the normal tariffs that WTO members charge on imports, as opposed to the preferential tariffs under free trade agreements and other schemes). No agreed definition exists at the multilateral level of what those goods are. In this paper, the relevant goods comprise machines (and their parts) for waste management, remanufacturing and recycling; drip-irrigation systems and their components (for efficient water use); recycled paper; sacks and bags made of natural fibres; and inputs to produce bioplastics, among others. Average MFN tariffs applied on these goods by individual WTO members range from 0 to almost 20%, with tariffs on specific goods as high as 50%.

Since 2001, WTO members have pursued initiatives to reduce or eliminate tariffs and other barriers affecting trade in so-called environmental goods and services. Environmental goods and services perform a variety of functions essential to tackling environmental problems, regenerating the natural environment and making production and consumption more sustainable. They comprise many goods and services that are needed to turn circular economy approaches into reality.

An initial effort to open trade in environmental goods and services in the WTO took place in the context of the Doha negotiations launched in 2001. Subsequently, a group of 46 WTO members engaged in negotiations aimed at liberalizing trade in environmental goods under the Environmental

Goods Agreement or EGA.[18] This initiative was launched in 2014 and seeks to build on a 2012 decision by Asia-Pacific Economic Cooperation (APEC) economies to cut tariffs voluntarily to 5% or less on 54 environmental goods.

EGA participants consulted with a broad range of experts and stakeholders and conducted their own assessments to understand specific environmental challenges and the types of technologies needed to tackle them. Based on those assessments, they nominated goods of interest for tariff reduction across ten agreed product categories, including some which are relevant to a circular economy. The relevant categories are resource efficiency; solid and hazardous waste management; wastewater management and water treatment; cleaner and renewable energy; and environmental monitoring, analysis and assessment.

EGA participants envisaged the EGA as a "future-oriented agreement" which would allow them to expand and adapt the list of environmental goods to new and unforeseen environmental challenges, technological innovation, market and regulatory developments, as well as the participants' own experience in applying the agreement.

EGA participants also recognized that additional efforts in related areas such as environmental services would be needed to facilitate and promote trade in environmental goods, given that environmental services are essential for the optimum delivery, installation, operation, maintenance and disposal of environmental goods. Non-tariff barriers were also identified as an area deserving further attention. The EGA negotiations, which began in mid-2014, have not been active since December 2016.

3.4 Aid for Trade: strengthening the capacity and infrastructure in developing countries to participate and benefit from a circular economy

WTO members launched the Aid for Trade initiative at the WTO's 6th Ministerial Conference in Hong Kong, China, in 2005. Aid for Trade aims to assist developing countries with strengthening skills, supply capacity and trade-related infrastructure to benefit from WTO agreements and to expand their trade.

The WTO works on Aid for Trade in cooperation with developing countries, regional organizations, multilateral development banks, donor countries and a range of UN and other international organizations, including the Organisation for Economic Co-operation and Development (OECD). SDG 8a calls for an "increase in Aid for Trade support for developing countries, particularly LDCs".

The Aid for Trade work programme for 2020-2021 identifies the circular economy as a focus area and highlights the opportunities that the circular economy offers for economic and export diversification in developing countries. The focus on circular economy in the new Aid for Trade work programme reflects the growing attention to environmental sustainability in development cooperation (Box 6). Of the USD 340 billion disbursed under Aid for Trade between 2006 and 2016, around one-third (USD 112 billion) has been allocated to projects with an environmental goal (WTO and UNEP, 2018). These developments provide a strong foundation to expand the role of Aid for Trade in the circular economy.

[18] Counting also the individual members states of the European Union. The WTO members participating in the EGA are: Australia; Canada; China; Costa Rica; the European Union; Hong Kong, China; Iceland; Israel; Japan; Korea; New Zealand; Norway; Singapore; Switzerland; Liechtenstein; Chinese Taipei; Turkey; and the United States.

Box 6. Aid for Trade in action: Unlocking the hidden value of cotton by-products in least-developed countries (LDCs)

Cotton is grown primarily for its fibre or lint (the raw material in cotton textiles), and several LDCs, particularly in Africa, are producers and exporters of cotton lint. But cotton farming and processing can yield several value-added products from other parts of the cotton plant, including the stalks, husks, cottonseed and short staple fibres.

Cotton by-products can be divided into two broad categories: those derived from the ginning and oil milling process, such as linters, husks, oil and cake; and the products that can be obtained from the ligneous stalks of the plant, such as organic fertilizers, briquettes, pellets, substrates for growing mushrooms and particle boards. Stalks, for example, represent two-thirds or more of the cotton plant's total biomass. In LDCs, they are often burned to comply with post-harvest pest management regulations. Yet, burning stalks constitutes a net waste of soil nutrients and contributes to increasing carbon emissions. Processing stalks into smokeless briquettes and pellets would increase domestic value added in cotton-producing LDCs and allow them to reduce their reliance on wood charcoal for fuel. This would result in benefits for trade, human health and the environment.

Cotton by-products provide opportunities for LDCs to create new income streams for farmers and processors, increase domestic value added, diversify exports and reduce waste in cotton value chains. According to the International Cotton Advisory Committee (ICAC) cotton by-products are underutilised, or even neglected in LDCs. ICAC estimates the value of unused cottonseed in a group of African LDCs at USD 237 million per year. Fostering the development of cotton by-product activities in LDCs would require technical and scientific assessments, capacity building, support for product commercialisation, establishment of clear strategies to mobilise investments and transfer of the necessary technologies.

Against this backdrop, the WTO, in cooperation with the International Trade Centre (ITC) and the United Nations Conference on Trade and Development (UNCTAD), is implementing a pilot project which focuses on eight African LDCs that produce cotton. The project has benefitted from the initial support of the Enhanced Integrated Framework (EIF), a multilateral partnership dedicated to assisting LDCs to use trade as an engine for growth, sustainable development and poverty reduction. The circular economy is at the core of this project, which focuses on adding value to re-usable waste from cotton harvesting and pre-industrial processing to achieve long term economic, environmental and social benefits, particularly for smallholder farmers, women and young workers.

Source: WTO online information, "Members discuss progress on cotton by-products initiative, negotiations, launch of World Cotton Day", available at: https://www.wto.org/english/news_e/news19_e/cott_07jun19_e.htm

Among the many areas where Aid for Trade could play a role is the infrastructure related to standards and trade facilitation. Effective and efficient standards and trade facilitation infrastructures are a necessary condition to expand the role of trade and trade policy in a circular economy.

For example, strengthening the standards infrastructure — including the capacity for conducting internationally-recognized inspection, testing, and certification — could help increase countries' participation in global markets for circular economy. Part of the reason is that a well-functioning national and regional standards infrastructure helps to build trust along supply chains by allowing domestic companies to demonstrate compliance with the transparency, traceability and other requirements that are needed for a circular economy to operate safely and efficiently at a global scale.

Strengthening the infrastructure for trade facilitation would complement these efforts, not least by promoting the shift towards risk-based customs control and release processes. Such initiatives could play an important role to minimize the risk of unwanted waste imports entering a country. At the same time, they can facilitate imports of legitimate goods, components and materials flowing in and out of circular economy processes, thus increasing the chances that companies from developing countries can participate in the global value chains underpinning the circular economy. Risk-based customs processes and other trade-facilitation measures also play a key role in cross-border e-commerce, which is rapidly becoming a key channel for trade in goods related to reuse, repair and other activities that are central to the circular economy.

4 CONCLUSIONS

As interest in circular economy approaches grows, it becomes increasingly important to ensure that trade policies are designed and implemented with the goals of a circular economy in mind. Not doing so would be a missed opportunity, given the unique role of trade to scale up circular economy solutions worldwide. Moreover, disregarding the need to align trade policies with circular economy approaches risks reinforcing linear "take-make-discard" approaches. As a result, countries around the world may forego the potential benefits of moving towards a safe and efficient global circular economy, including better human health and environmental outcomes, higher productivity and new opportunities to diversify trade and the economy.

Experience at the WTO provides valuable insights into how WTO members can intensify trade cooperation efforts in support of a safe and efficient global circular economy. At the WTO, members have addressed issues related to the circular economy through policy dialogue, peer review, negotiations and more recently, Aid for Trade. This work paves the way for WTO members to expand the positive contribution of trade to a circular economy, not least by: (i) improving their collective understanding of how trade interacts with the circular economy; (ii) building trust and confidence to engage in mutually beneficial trade related to circular economy activities; (iii) opening and facilitating trade in key areas of the circular economy; and (iv) supporting efforts in developing countries to seize the potential environmental, economic and trade benefits of a circular economy.

5 REFERENCES

Ellen MacArthur Foundation online, "What is the Circular Economy?", https://www.ellenmacarthurfoundation.org/circular-economy/what-is-the-circular-economy.

EU Commission (2020), Staff Working Document, Executive Summary of the Evaluation of Regulation (EC) N° 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste, SWD(2020) 26 final.

European Commission online, "First Circular Economy Action Plan", https://ec.europa.eu/environment/circular-economy/first_circular_economy_action_plan.html.

FONERWA online, "Remarks by Minister Biruta at 2019 National Circular Economy Forum", http://fonerwa.org/blog/remarks-minister-biruta-2019-national-circular-economy-forum.

Government of the Netherlands (2016), *A Circular Economy in the Netherlands by 2050*, https://www.government.nl/documents/policy-notes/2016/09/14/a-circular-economy-in-the-netherlands-by-2050.

Japanese Ministry of the Environment (2018), *The 4th Fundamental Plan for Establishing a Sound Material-Cycle Society*, https://www.env.go.jp/recycle/recycle/circul/keikaku/pam4_E.pdf.

Korinek, J (2019). "Trade restrictions on minerals and metals", *Mineral Economics* 32, 171–185, https://doi.org/10.1007/s13563-018-0161-z.

Li, W. and W. Lin (2016), "Circular Economy Policies in China", in Anbumozhi, V. and J. Kim (eds.), *Towards a Circular Economy: Corporate Management and Policy Pathways*, ERIA Research Project Report 2014-44, Jakarta, https://www.eria.org/RPR_FY2014_No.44_Chapter_7.pdf.

Lim, A.H., S. Mathur and G. Suk (2020), "Trade and environment: what can we learn from trade policy reviews?", *WTO Staff Working Papers*, No. ERSD-2020-06, March, https://www.wto.org/english/res_e/reser_e/ersd202006_e.htm.

McCarthy, A., R. Dellink and R. Bibas (2018a), "The Macroeconomics of the Circular Economy Transition: A Critical Review of Modelling Approaches", *OECD Environment Working Papers*, No. 130, Paris, https://doi.org/10.1787/af983f9a-en.

McCarthy, A. and P. Börkey (2018b), "Mapping support for primary and secondary metal production", *OECD Environment Working Papers*, No. 135, Paris, https://doi.org/10.1787/4eaa61d4-en.

OECD (2019a), *Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences*, Paris, https://doi.org/10.1787/9789264307452-en.

OECD (2019b), *Business Models for the Circular Economy: Opportunities and Challenges for Policy*, Paris, https://doi.org/10.1787/e59f8dd6-en.

OECD and WTO (2019), *Facilitating Trade through Regulatory Cooperation: The Case of the WTO's TBT/SPS Agreements and Committees*, Paris and Geneva, https://doi.org/10.1787/ad3c655f-en.

PACE online, "African Circular Economy Alliance", https://pacecircular.org/african-circular-economy-alliance.

SITRA (2019), *Leading the Cycle: Finnish road map to a circular economy 2016-2025*, https://www.sitra.fi/en/publications/leading-cycle/.

Schröder, P., K. Anggraeni and U. Weber (2018), "The Relevance of Circular Economy Practices to the Sustainable Development Goals", *Journal of Industrial Ecology* 23 (1), February 2019, https://doi.org/10.1111/jiec.12732.

International Resource Panel (2019), *Global Resources Outlook 2019: Natural Resources for the Future We Want*, United Nations Environment Programme, Nairobi, Kenya, https://www.resourcepanel.org/reports/global-resources-outlook.

UNEP (2013), *Metal Recycling: Opportunities, Limits, Infrastructure, A Report of the Working Group on the Global Metal Flows to the International Resource Panel*, http://hdl.handle.net/20.500.11822/8423.

US EPA (2015), *EPA Sustainable Materials Management Program Strategic Plan for Fiscal Years 2017–2022*, https://www.epa.gov/smm/epa-sustainable-materials-management-program-strategic-plan-fiscal-years-2017-2022.

WBCSD online, "WBCSD and Circular IQ partner to scale up the circular economy uptake by business", https://www.wbcsd.org/Overview/News-Insights/General/News/WBCSD-and-Circular-IQ-partner-to-scale-up-the-circular-economy-uptake-by-business.

WTO and UNEP (2018), *Making trade work for the environment, prosperity and resilience*, Geneva, https://www.wto.org/english/res_e/publications_e/unereport2018_e.pdf.

Yamaguchi, S. (2018), "International Trade and the Transition to a More Resource Efficient and Circular Economy: A Concept Paper", *OECD Trade and Environment Working Papers*, No. 2018/03, Paris, https://doi.org/10.1787/847feb24-en.

6 ANNEX

Table A.1 Examples of trade measures affecting resource efficiency along the product lifecycle identified in Trade Policy Reviews, 2009-17

	Taxes and duties	Regulations	Government support	Others
Extraction	Contribution by mining companies into environmental preservation fund	Standards for responsible mining; export restrictions on minerals (e.g., pebbles, gravel and stone)	Assistance to mitigate the environmental effects of mining	State trading arrangements to protect exhaustible and non-recyclable natural resources; agreements with mining companies for the use environmentally friendly technologies; environmental impact assessment requirements; strategies for investment promotion in mining sector
Design	Charges on difficult-to-recycle items	Technical regulations, standards and labelling requirements (e.g., packaging, hazardous content in electrical and electronic equipment)	Preferential tax treatment for research and development (e.g., "green cars")	None
Production and consumption	Product taxes (e.g., plastic packaging and single-use plastics, beverage containers, batteries, tyres, second-hand vehicles); green tax on stays by tourists	Technical regulations, standards and certification schemes (e.g., second-hand vehicles); import restrictions and licensing requirements (e.g., non-biodegradable plastic bags, re-treaded tyres, second-hand vehicles, used batteries)	Resource efficiency payments (e.g., for precision-application of pesticides and fertilizer); tax concessions for companies using waste as an input	Pre-shipment inspection for used machinery and transport equipment

Repair, remanufacture	None	Import licensing requirement for remanufactured goods	Duty rebate for goods sent abroad for repair	None
Recycling	Recycling levies (e.g., glass beverage containers, paper, electrical and electronic equipment)	Labelling schemes for recyclables; import bans and licensing requirements (e.g., hazardous materials)	Tax incentives, grants and other support (e.g., for plastic recycling plants, agricultural waste recycling activities); tax exemptions for recycling machinery	Strategies and targets, investment promotion plans; procurement provisions for recycled goods; pre-shipment inspection (e.g., for waste used as raw material)
Waste disposal	Landfill taxes and disposal fees (oil products, organic solvents, halogenated compounds, paint, printing inks)	Import and export bans and licensing requirements on several categories of waste and scrap	Preferential tax treatment for plastic and biodegradable waste collection and other waste treatment activities; incentives and other support for waste-to-energy operations; support for related innovation	Investment incentives for waste management activities; targets for landfill reduction; port designations for imports of metallic waste and scrap; special preferential rules of origin for waste and scrap (in free-trade agreements); fast-tracking of applications for patents in waste management; public-private partnerships for waste treatment

Source: WTO Environmental Database, available at: edb.wto.org.

Table A.2 Examples of STCs related to the circular economy

Title	Raised by (date)	Circular economy-related coverage	Relevant WTO documents
European Communities — Directive 2002/95/EC on the Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) and Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE)	Australia, Canada, China, Israel, Japan, Jordan, Korea, Malaysia, Mexico, Thailand, Egypt, United States, Bolivarian Republic of Venezuela (31.03.1999)	Eco-design, hazardous content standards, end-of-life treatment	G/TBT/M/15-25 G/TBT/M/27-28 G/TBT/M/36 G/TBT/M/39 G/TBT/M/44-56 G/TBT/N/EEC/247 and Add.1 and 2 G/TBT/Notif.00/310
European Communities — Ban on the Use of Nickel-Cadmium in Batteries	Australia, Canada, China, Japan, Thailand, Egypt, United States, Bolivarian Republic of Venezuela (11.06.1999)	Hazardous content standards	G/TBT/M/16 G/TBT/M/17-22 G/TBT/M/24-25 G/TBT/M/39 G/TBT/M/48 G/TBT/N/EEC/98
Japan — Promotion of Effective Use of Resources	Korea, Malaysia (30.03.2001)	Eco-design, reuse and recyclability standards	G/TBT/M/23 G/TBT/M/25-26 G/TBT/N/JPN/8
European Communities — Directive on the Type-Approval of Motor Vehicles with regard to their Re-Usability, Recyclability and Recoverability	Korea (01.07.2004)	Eco-design, reuse and recyclability standards	G/TBT/M/33 G/TBT/N/EEC/61
Korea — Proposed Act for Resource Recycling of Electrical/Electronic Products and Automobiles	Japan, United States, European Union (15.03.2006)	Recyclability standards	G/TBT/M/38 G/TBT/M/39-40 G/TBT/N/KOR/105 and Add.1
Chinese Taipei — Plastic trays and packaging	European Union (05.07.2007)	Plastics packaging requirements	G/TBT/M/42 G/TBT/N/TPKM/43
India — E-Waste (Management and Handling) Rules 2010	United States (15.06.2011)	Extended producer responsibility	G/TBT/M/54 G/TBT/N/IND/41
Brazil — Draft ANVISA Resolution on used, refurbished, rented and lent medical devices	European Union, Switzerland (27.11.2012)	Refurbishment, remanufacturing	G/TBT/M/58 G/TBT/M/59-62 G/TBT/N/BRA/440
France — Recycling Triman Mark: "Draft Decree on a common set of symbols informing the consumer about recyclable products subject to a system of extended producer responsibility associated with waste sorting instructions"	Canada, Mexico, New Zealand, United States (19.03.2014)	Extended producer responsibility, recycling labelling	G/TBT/M/62 G/TBT/M/63 G/TBT/M/64/Rev.1 G/TBT/M/65 G/TBT/N/FRA/153
Japan — Wood Use Points Programme	Russian Federation (18.03.2015)	Eco-design, biodegradability, recycling, incentives for forest conservation	G/TBT/M/65 G/TBT/N/JPN/471

India — E-waste (Management) Rules, 2016	European Union, United States, Australia, Japan, Canada (21.03.2018)	Extended producer responsibility	G/TBT/M/70 G/TBT/M/71
China — Catalogue of Solid Wastes Forbidden to Import into China	Japan, United States, European Union, Australia; Canada, New Zealand (13.11.2019)	Waste management, recycling	G/TBT/M/73 G/TBT/M/74-78 G/TBT/W/546 G/TBT/W/574 G/TBT/W/579 G/TBT/W/610 G/TBT/W/618 G/TBT/N/CHN/1211-12 G/TBT/N/CHN/1224-34
China — Chinese Environmental protection control standards for imported solid waste as raw materials	European Union, United States, Australia, Japan, Canada (06.03.2019)	Recyclability standards	G/TBT/M/74 G/TBT/M/75-77 G/TBT/W/472 G/TBT/W/468 G/TBT/W/547 G/TBT/W/580
Trinidad and Tobago — Regulation related to the prohibition, of commercialization and importation of plastic products of polystyrene	Dominican Republic (06.03.2019)	Plastics, material content standards	G/TBT/M/77
Jamaica — Regulations Banning Single-Use Plastic Products	Dominican Republic (06.03.2019)	Plastics, material content standards	G/TBT/M/77 G/TBT/W/611
Kingdom of Saudi Arabia — Technical Regulation for plastic products OXO – biodegradable	European Union, United States (06.03.2019)	Plastics, material content standards	G/TBT/M/77-78 G/TBT/W/626 G/TBT/N/SAU/947
European Union — Draft Commission Regulation laying down eco-design requirements for electronic displays pursuant to Directive 2009/125/EC of the European Parliament and of the Council, amending Commission Regulation (EC) No 1275/2008 and repealing Commission Regulation (EC) 642/2009 (and its accompanying annexes)	China, Japan, United States (06.03.2019)	Eco-design, repairability and recyclability standards	G/TBT/M/77-78 G/TBT/W/616 G/TBT/W/606 G/TBT/N/EU/609